U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Regulations

Part 35
Airworthiness Standards: Propellers

This edition replaces the existing loose-leaf Part 35 and its changes.

This FAA publication of the basic Part 35, effective February 1, 1965, incorporates Amendments 35–1 through 35–6 with preambles.

Published
September 1993

NOTICE TO FAA AND OTHER GOVERNMENT USERS

Distribution of changes to this part within the Federal Aviation Administration and other U.S. Government agencies will be made automatically by FAA in the same manner as distribution of this basic part.

and is reflected in the mailing label used to send you Notices of Rulemaking, therefore, it is important that you save one of the mailing labels and include it in any correspondence you initiate concerning this NPRM service as it will ensure positive identification and prompt response.

NPRM ORDER FORM

U.S. Department of Transportation
Office of the Secretary
Distribution Service Branch, M–484.1
Washington, DC 20590

Please place the following on the Part 35 Notice of Rulemaking mailing list:

Title or Name:

Company:

Address _____
(Street)

_____
(City) (State) (Zip)

NOTICE TO FAA AND OTHER GOVERNMENT USERS

FAA and other U.S. Government Personnel are NOT to use this form since distribution of the "Status of Federal Aviation Regulations," as well as changes to this part, will be made automatically by FAA in the same manner as distribution of this basic part.

ORDER FORM

Department of Transportation
Distribution Requirements Section, M–483.1
Washington, D.C. 20590

Please place my name on the mailing list to receive the "Status of Federal Aviation Regulations," AC 00–44. I am not presently on any Advisory Circular mailing list.

Name _____

Address _____
(Street)

_____
(City) (State) (Zip)

operating limitations A–1

Subpart B—Design and Construction

35.11 Applicability B–1
35.13 General B–1
35.15 Design features B–1
35.17 Materials B–1
35.19 Durability B–1
35.21 Reversible propellers B–1
35.23 Pitch control and indication B–1

Subpart C—Tests and Inspections

35.31 Applicability C–1
35.33 General C–1
35.35 Blade retention test C–1
35.37 Fatigue limit tests C–1
35.39 Endurance test C–1
35.41 Functional test C–2
35.42 Blade pitch control system component test C–2
35.43 Special tests C–2
35.45 Teardown inspection C–2
35.47 Propeller adjustments and parts replacements C–2

Appendix A

Instructions For Continued Airworthiness ..... App. A–1

During the life of the recodification project, Chapter I of Title 14 may contain more than one Part bearing the same number. To differentiate between the two, the recodified Parts, such as this one, will be labeled ''[New]''.The label will of course be dropped at the completion of the project as all of the regulations will be new.

It should he noted that at this time we are not assigning an effective date for Part 35 [New]. The procedural requirements of Part 14 of the Civil Air Regulations are proposed to be included in Part 21 [New] as published in the Federal Register May 27, 1984 (29 FR 7000). Action will be taken later to make Part 35 [New] effective on the same date that Part 21 [New] Is made effective. In addition, at that time Part 14 will be rescinded in its entirety.

A number of changes have been made in the proposal, both as a result of comments received and as a result of further review by the Agency. The reference to ''repair and overhaul'' in proposed § 35.3 [New] has bean deleted since these terms are included in the term ''maintenance'' as defined In Part 1 [New].

Section 35.11 has been amended to delete, as obsolete, the language that limited the applicability of the subpart to propellers ''installed, operated, and maintained in accordance with the instruction manual''. Section 35.21 has been clarified by including the provisions of present 14.103–1. The requirements of 14.18(a), originally scheduled to be included in Part 21 [New], have been included in 35.33. In addition, the substance of 14.16(c) has been included in § 35.5.

Other minor changes of a technical nature have been made. They are not substantive and do not impose any burden on regulated persons.

The definitions, abbreviations, and rules of construction contained in Part 1 [New] of the Federal Aviation Regulations apply to Part 35 [New].

This amendment is made under the authority' of 11313(a), 801, and 803 of the Federal Aviation Act of 1958(49 U.S.C. 1354(a), 1421, and 1423).

In consideration of the foregoing Chapter I of Title 14 is amended by adding a Part 35 [New] reading as hereinafter set forth.

Effective Date. As previously noted this amendment does not contain an effective date but will be made effective on the same date that Part 21 [New] becomes effective.

Amendment 35–1

Effective Date of Certain Recodified Rules and

Repeal of Certain Special Regulations

Adopted: January 8, 1965 **Effective: February 1, 1965**

(Published in 30 F.R. 535, January 15, 1965)

The amendments adding Parts 33—Airworthiness Standards: Aircraft Engines (including amendment 1–5 adding certain definitions to Parts 1 and 35—Airworthiness Standards: Propellers published in the Federal Register on June 10, 1964 (29 F.R. 7452 and 7458, respectively) did not contain effective dates for these Parts.

As stated in the preamble to each of these Parts the Agency could not assign an effective date until the effective date of Part 21—Certification Procedures for Products and Parts was known, since

* Part 21—Certification Procedures for Products and Parts [New].

(1) Parts 33, 35, and amendment 1–3 to Part 1 of the Federal Aviation Regulations are made effective February 1, 1965.

(2) All Special Civil Air Regulations not heretofore repealed are hereby repealed effective April 1, 1965.

This amendment is made under the authority of §§ 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

Amendment 35–2

Miscellaneous Powerplant Design Requirements for Aircraft Engines and Propellers

Adopted: February 24, 1967 **Effective: April 3, 1967**

(Published in 32 F.R. 3733, March 4, 1967)

This amendment adds miscellaneous powerplant design requirements for aircraft engines and propellers, and withdraws certain proposals for rotorcraft. This amendment is based on, and reflects industry comments concerning, Notice of Proposed Rule Making 66–3, published in the Federal Register (31 F.R. 2485) on February 8, 1966. Except as modified by the following discussion, the reasons for this amendment are those in the Notice. Changes from the Notice, and Agency disposition of industry comments, are as follows.

In place of deleted § 35.15 (which proposed deletion is withdrawn above), the Notice proposed to add a new section, entitled "Pitch Control System", which would have required that each variable pitch propeller that tends to go to low pitch if "the pitch control system fails" must incorporate means to "automatically lock the pitch" to prevent hazardous overspeeding, and that "each pitch control system" that uses engine oil for feathering must incorporate means to "position the governor pilot valve for feathering without using engine oil" or incorporate means to "let feathering oil bypass the governor pilot valve." One comment stated that the words "the pitch control system fails" imply that the propeller manufacturer must anticipate all possible failures of pitch control system components whose design will not be known until later certification of an engine or aircraft. This is not intended. The commentator suggests language which would require the propeller manufacturer to consider hazardous overspeeding only where that hazard is caused by failure of the "pitch control mechanism contained within the propeller, or supplied, with the propeller." This language is too narrow. The intended pitch changing function is a design feature of the propeller regardless of the location or certification status of the mechanisms for performing that function. If the propeller design includes an intended pitch changing method or function, safety requires that the consequence of failure of this intended function, within intended operating conditions, be given design consideration by the propeller applicant. New § 35.23(a) therefore provides that the propeller pitch control, however caused, under "intended operating conditions." Responsibility and control by the propeller applicant over engine or aircraft "systems" or "mechanisms" that could cause such failures is not implied by this amendment. So far as the words "each pitch control" in proposed paragraph (b) are concerned, the Agency agrees that limitation to "each pitch control system within the propeller, or supplied with the propeller" is appropriate, since the propeller applicant responsibility for systems, rather than intended propeller functions, is involved. Paragraph (b) is drafted accordingly. One comment stated that to require a means to "automatically lock the pitch" to prevent hazardous overspeeding could unnecessarily restrict design, and that the objective prevention of hazardous overspeeding is all that is necessary. The Agency agrees. Paragraph (a) is so drafted. Further, the Agency believes that a similarly unnecessary design restriction could result from the requirement, in proposed paragraph (b), that there be means to "position the governor pilot value . . ." or means to "let feathering oil bypass the government pilot value". The objective of this proposal is to require means to override or bypass the normally

not intended. This amendment therefore is specifically limited to "each metal hub and metal blade" and "each primary load-carrying metal component of nonmetallic blades," but is otherwise drafted as proposed.

The Notice proposed to amend § 35.37 to require that the prescribed tests be conducted on a propeller of the greatest diameter for which certification is requested. One comment objected for the following reasons: The commentator states that, in several ways, such as test airspeed and blade angle, actual tests conducted under § 35.39 do not simulate operational loads and therefore do not "substantiate the propeller loads that are expected in operation", contrary to the Notice. The Agency agrees that there are some operating conditions that are not simulated in the tests. However, notwithstanding these, proper test equipment can sufficiently simulate, and provide a basis to substantiate, the maximum steady loads that the propeller will actually experience in the takeoff regime when the power and engine speed are greatest, the air speed and blade angle are lowest, and the corresponding thrust and centrifugal loads are the greatest. Substantiation of these loads is necessary for safety. Regardless of other variable in the testing process, substantiation of these loads cannot be properly established with reduced propeller diameters. The commentator states in effect that an inadequate testing environment obviates the need to use the full diameter in the test since any advantage in simulation that would result would be eliminated or hidden by the unrepresentative effects of the poor test environment. The Agency disagrees. Proper substantiation of the steady propeller takeoff loads is necessary for safety. No showing has been made that adequate test facilities cannot be designed and feasibly provided for this purpose. This amendment is therefore drafted as proposed.

In consideration of the foregoing, Subchapters A (Part 1*) and C (Parts 21, 33, and 35) of Chapter I of Title 14 of the Code of Federal Regulations are amended, effective April 3, 1967.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

Amendment 35–3

Airworthiness Review Program

Amendment No. 3: Miscellaneous Amendments

Adopted: December 13, 1976 **Effective: February 1, 1977**

(Published in 41 F.R. 55454, December 20, 1976)

The purpose of these amendments is to update and improve—(1) the aircraft, engine, and propeller certification regulations; (2) the operating regulations containing airworthiness standards; and (3) related procedural requirements.

These amendments are based on a notice of proposed rulemaking (Notice 75–10) published in the FEDERAL REGISTER on March 7, 1975 (40 FR 10802) and are the third in a series of amendments to be issued as part of the First Biennial Airworthiness Review Program. The following series of amendments have previously been issued as part of this Airworthiness Review Program:

Title	*Federal Register citation*
Form number and clarifying revisions	(40 F.R. 2576; Jan. 14, 1975)
Rotorcraft anticollision light standards	(41 F.R. 5290; Feb. 5, 1976)

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matter presented. A number of substantive changes and

75–19	40 F.R. 21800; May 19, 1975	Notice No. 9: Powerplant Proposals.
75–20	40 F.R. 22110; May 20, 1975	Notice No. 4: Equipment Deviation List.
75–23	40 F.R. 23048; May 27, 1975	Notice No. 5: Equipment and Systems Proposals.
75–25	40 F.R. 24664; June 9, 1975	Notice No. 6: Flight Proposals.
75–26	40 F.R. 24802; June 10, 1975	Notice No. 7: Airframe Proposals.
75–31	40 F.R. 29410; July 11, 1975	Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals.

Based upon further review by the FAA, a number of proposals which were contained in Notice 75–10 are not being dealt with herein but will be considered in conjunction with other proposals contained in one of the later Airworthiness Review Program Notices of proposed rulemaking.

The following discussion is keyed to the like-numbered proposals contained in Notice 75–10:

Proposal 2–1. One commentator suggested that the proposed change to § 21.33(a) be revised to limit the new aircraft engine and propeller inspection and test provisions to prototypes only. The FAA does not agree. The intent of the proposals was to make the inspection and test requirements in § 21.33(a) compatible for aircraft, aircraft engines, and propellers. The provision applies to the item presented for type certification tests irrespective of whether or not the item is considered a prototype by the applicant for the type certificate. The proposal is therefore, adopted without substantive change.

Proposal 2–2. No unfavorable comments were received on the proposal to amend § 23.23. Accordingly, the proposal is adopted without substantive change.

Proposal 2–3. No unfavorable comments were received on the proposal to amend § 23.141. Accordingly, the proposal is adopted without substantive change.

Proposal 2–4. No unfavorable comments were received on the proposal to amend § 23.143(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2–5. No unfavorable comments were received on the proposal to amend § 23.145. Accordingly, the proposal is adopted without substantive change.

Proposal 2–6. The proposed change to § 23.149(b) concerning the language "without exceptional piloting skill, alertness, or strength" is related to a proposed amendment to § 23.149 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.149(b) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–6 will be considered at that time.

Proposal 2–7. Although no unfavorable comment was received on the proposal to amend § 23.175(c), the FAA believes that clarification is necessary. The term "or thrust" has been added to the end of the language "maximum cruising power" in proposed § 23.175(c)(3). Proposed § 23.175(c)(4) was intended to clarify the requirement concerning trim speed, but the FAA believes the conflict in language with a similar provision in § 23.175(b)(2)(iii) may cause confusion. Therefore, proposed § 23.175(c)(4) is withdrawn.

Proposal 2–8. The proposed change to § 23.253(b) is related to a proposed amendment to § 23.253(b)(3) that is contained in Airworthiness Revliew Program, Notice No, 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75–31; 40 FR 29410 July 11, 1975). The proposed amendment to § 23.253(b) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–31, Comments submitted for Proposal 2–8 will be considered at that time.

Proposal 2–9. No unfavorable comments were received on the proposal to amend § 23.397. Accordingly, the proposal is adopted without substantive change.

ingly, the proposal is adopted without substantive change.

Proposal 2–13. A commentator questioned whether proposed § 23.675 would require that stops provided to limit the range of motion of an aerodynamic surface be located only on the aerodynamic surface or whether the stop could be located adjacent to the surface. Section 23.675, as proposed and as adopted herein, without change, requires that stops positively limit the range of motion of moveable aerodynamic surfaces. This can be accomplished by locating the stop on structure adjacent to the surface.

Proposal 2–14. No unfavorable comments were received on the proposal to amend § 23.685(a). Accordingly, the proposal is adopted without substantive change. See proposal 2–109.

Proposal 2–15. No unfavorable comments were received on the proposal to add a new § 23.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–16. No unfavorable comments were received on the proposed new § 23.787(f). However, one commentator pointed out that the word "contract" in the proposal as printed in the Federal Register should be "contact." The proposal has been corrected to eliminate the printing error. The proposal has also been clarified based on a comment received on Proposal 2–111, to avoid any implication that lamps will be required in cargo compartments.

Proposal 2–17. One commentator questioned the need in proposed § 23.841(b)(6) for a warning indicator at the pilot station to indicate when a cabin pressure altitude of 10,000 feet is exceeded. But as noted by the commentator it is a general industry practice to provide this warning at a cabin altitude of 10,000 feet. The FAA believes that due to the larger number of small airplanes having such a warning, many pilots may come to rely on the warning at this cabin altitude. The proposal is therefore adopted without substantive change.

Proposal 2–18. The proposed changes to §§ 23.853, 27.853, and 29.853 concerning the certification requirements necessary to permit smoking in certain aircraft categories are related to proposed standards for § 25.853. The amendments proposed for § 25.853 are contained in Airworthiness Review Program Notice No. 2: Miscellaneous Proposals (Notice 75–10; 40 FR 10802; March 7, 1975) and in Airworthiness Review Program Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75–31; 40 FR 29410; July 11, 1975). The proposals for § 25.853 in Notice 75–10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–31. The proposed amendments to §§ 23.853, 27.853 and 29.853 contained in Notice 75–10 are therefore being deferred until final rulemaking action is taken with respect to the related proposal for § 25.853. Comments submitted for Proposals 2–18, 2–114, and 2–160 will be considered at that time.

Proposal 2–19. One commentator suggested a clarification of proposed new § 23.903(b) noting that the language, "must be designed to give reasonable assurance" would be subject to divergent application. The same language is now used in § 25.903(d)(2), and the FAA believes that experience with this provision in transport category type certification has been satisfactory.

One commentator suggested that a provision similar to § 25.903(d)(1) concerning design precautions to minimize hazards to the airplane in the event of an engine rotor failure be included in proposed §§ 23.903(b), 27.903(c), and 29.903(f). Although several airworthiness directives have been issued to prevent the failure of engine rotors in one engine type, the FAA does not believe that a general requirement for §§ 23.903(b), 27.903(c), or 29.903(f) that is identical to § 25.903(d)(1) is necessary at this time.

Proposal 2–20. No unfavorable comments were received on the proposal to amend § 23.933(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2–21. One commentator objected to proposed new § 23.941 concerning airplanes with variable inlet or exhaust system geometry as being unnecessary and unjustified in Part 23. The FAA agrees that this provision should not be added to Part 23 at this time and is therefore withdrawing the proposal.

system component. The commentator asserted that a strainer which met this requirement would have an opening so small that ice accumulation with the use of turbine fuels would be a problem. The FAA does not agree. This is identical to the provision in § 25.977(a)(2). Experience with fuel strainers that would meet the proposed standards in § 23.977(a)(2) has shown that a strainer can prevent the passage of the noted objects and also prevent ice accumulation.

One commentator noted that the clear area of each fuel tank outlet strainer should be at least six times the area of the outlet line instead of five times as proposed in § 23.977(b). This provision is identical to § 25.977(c) and the FAA considers that experience with this requirement in Part 25 has been satisfactory.

Proposal 2–24. The intent of the proposal to add a new § 23.979(e) was to provide strength requirements including load factors, applicable to the airplane defueling system to cover surge pressure during defueling. Upon further review the FAA believes that the proposed amendment is premature. Therefore, the proposal is withdrawn.

Proposal 2–25. No unfavorable comments were received on the proposal to amend § 23.995(d). Accordingly, the proposal is adopted without substantive change.

Proposal 2–26. One commentator suggested that there should be sufficient clearance between the quick actuation drain and other parts of the airplane to allow the fuel sample to be drained into a typical, small container. The FAA believes fuel system drains which meet the proposed requirements of paragraphs (b)(1) and (b)(3) of § 23.999, that the drain discharge clear of all parts of the airplane and that it be readily accessible, will have sufficient clearance to allow a fuel sample to be drained into a small container.

One commentator suggested that the requirement in § 23.999(b)(1) that the drain must discharge clear of all parts of the airplane, would create unnecessary design and construction restraints. The FAA believes that by coating some airplane surfaces with fuel or by trapping quantities of fuel in certain locations a fire hazard exists. This fire hazard should be limited by this proposal. Further, the FAA believes this requirement can be met without an undue restraint on airplane design.

A commentator asserted that the proposed requirement in § 23.999(b)(3), that the drain valve be either located or protected so that it will not be damaged in the event of a landing with landing gear retracted cannot be justified. The commentator noted that the fuel tanks would be ruptured in such a landing and nothing would be gained if the drain was protected. The FAA disagrees, similar fuel tank installation requirements are set forth in § 23.967 and experience indicates that the fuel system can and should be either located or protected to prevent fuel leakage in such a landing. The FAA does agree that the proposal needs to be clarified to more specifically provide a design specification and has so modified paragraph (b)(3). Also see Proposal 2–70.

Proposal 2–27. No unfavorable comments were received on the proposal to add a new § 23.1093(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–28. Proposed § 23.1111(c) was misunderstood by one commentator who asserted that it is not possible to assure the impossibility of failure of the engine lubricating system. The proposal, however, was directed toward the elimination of hazardous contamination of the cabin air assuming a failure of the engine lubricating system. In consideration of the misunderstanding, the language has been revised to emphasize the prevention of hazardous contamination of cabin air system.

Proposal 2–29. Although no unfavorable comment was received on the proposed § 23.1125, the FAA believes that the proposal could be misunderstood as to whether use of the heat exchanger would permit or prohibit the passage of exhaust gases through the exchanger when hot air was not being directed to the area where it was intended to be used. The FAA's intention was to require cooling of the exchanger wherever it was in contact with exhaust gases, regardless of its usage status. The proposal is revised to make this clear using the language of §§ 25.1125(a)(3) and 29.1125(a)(3). The FAA believes

engines since two separate primary electrical circuits are not required in § 33.69. The rule as adopted is applicable to turbine engines installed on small airplanes only.

Proposal 2–32. One commentator objected to the proposal to add a speed warning device for turbopropeller powered airplanes. The FAA believes that due to the characteristics of turbopropeller powered airplanes that make it desirable to operate at the maximum operating limit speed (**VM0/MM0**), and the increasing preoccupation of pilots with air traffic and other duties which distract them from continuous monitoring of airspeed instruments, overspeed conditions can be a problem. Therefore, to insure early warning and thus to make a major portion of the speed margin available for pilot reaction and recovery maneuvers, the amendment requires that the speed warning device must give effective aural warning (differing distinctively from aural warnings used for other purposes) to the pilots whenever the speed exceeds **VM0** plus 6 knots or **MM0**+0.01.

It should also be noted that the proposal for § 23.1303(d) has been revised to make it like § 25.1303(a)(1) to allow for an air temperature indicator which provides indications that are convertible to free-air temperature.

Proposal 2–33. No unfavorable comments were received on the proposal to amend § 23.1309. Accordingly, the proposal is adopted without substantive change.

Proposal 2–34. One commentator suggested that proposed §§ 23.1322 and 25.1322 concerning warning, caution, and advisory light be revised. The commentator noted that requiring a blue light for position indication was not always appropriate since blue was difficult to see in direct sunlight but was readily distinguishable in heavily shaded installations. The FAA agrees that blue should not be an established standard applicable to all installations. Therefore proposed §§ 23.1322(d), 25.1322(d), 27.1322(d) and 29.1322(d), concerning blue lights, are withdrawn. Also see Proposal 2–82.

Proposal 2–35. The proposed amendments to §§ 23.1325, 25.1325, and 29.1325 concerning the static pressure sources are related to proposed amendments to § 27.1325 that are contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75–10; 40 FR 10812; March 7, 1975) and in Airworthiness Review Program, Notice No. 5: Equipment and System Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposed amendment to § 27.1325 in Notice 75–10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. The proposed amendments to §§ 23.1325, 25.1325, and 29.1325 contained in Notice 75–10 are therefore being deferred until final rulemaking action is taken with respect to the related proposed amendments to § 27.1325. Comments submitted for Proposals 2–35, 2–83, and 2–183 will be considered at that time.

Proposal 2–36. One commentator questioned the proposed lead-in for § 23.1331(b). The commentator interpreted the proposal to mean that each instrument must have independent power sources and noted that the explanation did not indicate this to be intended. The FAA agrees that the proposal is not clear, and the proposal is withdrawn.

Proposal 2–37. The proposed change to § 23.1335 concerning the deletion of the section is related to a proposed amendment to § 23.1335 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposed amendment to § 23.1335 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. Comments submitted for Proposal 2–37 will be considered at that time.

Proposal 2–38. No unfavorable comments were received on the proposal to amend § 23.1351. Accordingly, the proposal is adopted without substantive change.

Proposal 2–39. Proposed § 23.1353(f) concerning nickel-cadmium batteries is related to a proposed amendment to § 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1353 contained in Notice

Proposal 2–42. One commentator suggested that the proposed change to § 23.1549 be revised to accommodate horizontal scale powerplant instruments. The FAA agrees, and §§ 23.1549, 27.1549 and 29.1549, as adopted, will provide marking standards appropriate to circular, horizontal and vertical scale powerplant instruments.

Proposal 2–43. The proposed change to § 23.1555 concerning the information requirements of usable fuel in a restricted use fuel tank is related to a proposed amendment to § 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1555 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–43 will be considered at that time.

Proposal 2–44. The proposed change to § 23.1557 concerning the system voltage marking requirement adjacent to its external power connection is related to a proposed amendment to § 23.1557 that is contained in Airworthiness Review Program, Notice No. 3; Powerplant Proposals (Notice 75–19; 40 FR 21866; May 19, 1975). The proposed amendment to § 23.1557 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–19. Comments submitted for Proposal 2–44 will be considered at that time.

Proposal 2–45. The proposed change to § 23.1581 concerning the Airplane Flight Manual is related to a proposed amendment to § 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related Proposal in Notice 75–25. Comments submitted for Proposal 2–45 will be considered at that time.

Proposal 2–46. The proposed change to § 23.1587(a)(2) is related to proposed amendments to § 23.1587 that were contained in Airworthiness Review Program, Notice 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–46 will be considered at that time.

Proposal 2–47. One commentator suggested that considering the proposed deletion of §§ 25.45 through 25.75, current § 25.161(e) will need to be amended to replace the reference to § 25.69. The FAA agrees, and § 25.161(e)(1) is amended by striking the reference to § 25.69 and inserting in place thereof a reference to § 25.123(a). In addition, the FAA has found that § 25.201(c)(1) refers to § 25.49(c)(2)(1) that would also be deleted. Therefore, § 25.201(c)(1) as amended strikes the phrase "§ 25.49(c)(2)(1) for reciprocating engine powered airplanes, or in" and the phrase "for turbine engine powered airplanes".

Proposal 2–48. No unfavorable comments were received on the proposed change to strike the words "turbine powered" from § 25.101(a). Accordingly, proposed § 25.101(a) is adopted without substantive change.

No unfavorable comments were received on proposed § 25.101(b) and it is adopted as proposed except that it is clarified to indicate that the 80% relative humidity for reciprocating engines is based on standard atmospheric temperature (the vapor pressure values in the table in proposed § 25.101(b)(2) correspond to 80% relative humidity with a standard atmosphere).

Proposal 2–49. Based on comments received on the proposal to amend § 25.105 and on the related proposals to §§ 25.125, 25.241 and 25.1533(c), and upon further review by the FAA, Proposals 2–49, 2–51, 2–52 and the portion of 2–93 dealing with the new operating limitation requirements for transport category airplanes intended to be used in operations on unpaved runways are withdrawn.

Proposal 2–50. No unfavorable comments were received on the proposal to amend § 25.107. Accordingly, the proposal is adopted without substantive change.

Proposal 2–55. No unfavorable comments were received on the proposal to amend § 25.675. Accordingly, the proposal is adopted without substantive change. Also see Proposal 2–13.

Proposal 2–56. No unfavorable comments were received on the proposal to amend § 25.685(a). Accordingly, the proposal is adopted without substantive change. See Proposal 2–109.

Proposal 2–57. No unfavorable comments were received on the proposal to add a new § 25.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–58. One commentator questioned whether the proposcd § 25.775(e) would require that there be at least two windshield panels in the windshield for each pilot. The intent of the proposal, however, is to provide at least one windshield panel through which at least one pilot could see if vision was lost through another panel.

Proposal 2–59. Proposed § 25.783(g) concerning integral stairs installed in passenger entry doors that qualify as passenger exits is related to a proposed amendment to § 25.783 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75–31; 40 FR 29410; July 11, 1975). The proposed amendment to § 25.783(g) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–31. Comments submitted for Proposal 2–59 will be considered at that time.

Proposal 2–60. The proposed change to § 25.785 is related to a proposed amendment to § 25.785 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Proeedural Proposals (Notice 75–31; 40 FR 29410; July 11, 1975). The proposed amendment to § 25.785 contained in Notice No. 2 is, therefore, being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–31. Comments submitted for Proposal 2–60 will be considered at that time.

Proposal 2–61. No unfavorable comments were received on the proposed new § 25.787(c). However, based on a comment received on Proposal 2–111, this proposal has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2–62. Four of the five comments received were in favor of the proposal for § 25.815 that would provide for the approval of an aisle width of less than 12 inches, but not less than 9 inches, in transport airplanes with a passenger seating capacity of 10 or less if the aisle width is substantiated by necessary tests. One commentator quested that the proposal be withdrawn because it would result in a reduction in the margin of passenger safety. The FAA disagrees. Service experience with aircraft certificated with less than a 12 inch aisle width in the past has been satisfactory.

Moreover, the FAA will not certificate transport category aircraft with less than a 12 inch aisle width unless the Administrator finds by necessary test that the narrower aisle is safe.

The proposal is adopted without change.

Proposal 2–63. The proposed change to § 25.831 concerning the temperature and ventilation controls for the crew compartment is related to a proposed amendment to § 25.831 that is contained in Airworthiness Review Program Notice No. 5: Equipment and Systems Proposals (Notice 75–23; 40 FR 23048, May 27, 1975). The proposed amendment to § 25.831 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. Comments submitted for Proposal 2–63 will be considered at that time.

Proposal 2–64. One commentator recommended that proposed § 25.841(b)(1) be revised to make it clear that the pressure relief function may be combined with the regulating valve. The proposal would delete the requirement that one of the pressure relief valves be a pressure regulating valve, but it would still allow such a design. This was specifically covered in Notice 75–10.

is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine and Propeller Airworthiness, and Procedural Proposals (Notice 75–31, 40 FR 29410; July 11, 1975). The proposed amendment to § 25.853 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–31. Comments submitted for Proposal 2–65 will be considered at that time.

Proposal 2–66. No unfavorable comments were received on the proposal to amend § 25.933(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2–67. A commentator suggested that a cross-reference to § 25.143 should be added to proposed § 25.941. The FAA agrees that the pilot strength limits now set forth in § 25.143 should be referenced in § 25.941 in order to define appropriately what constitutes "exceptional strength on the part of the pilot". Accordingly, a paragraph (c) has been added to proposed § 25.941 for that purpose.

Proposal 2–68. Two commentators agreed with the intent of the proposed § 25.951(a) concerning fuel system design and operation of the auxiliary power unit (APU) but requested that it be withdrawn to allow time to review other Part 25 provisions for applicability to APU installations. The FAA does not believe that a further review of Part 25 should in this case, delay completion of this rulemaking action. However, if the FAA determines that the language "auxiliary power unit" should be specifically set forth in other provisions to avoid misinterpretation, the FAA will take action to clarify these provisions.

One commentator stated that the fuel system for an APU operated on the ground would be unnecessarily subject to the same requirement as the engine fuel system. The FAA does not agree that this is necessary. If certain operating conditions are the same for both the engine fuel system and the APU fuel system, the FAA believes that the requirements during such periods should be the same. The proposal is therefore adopted without substantive change.

Proposal 2–69. One commentator suggested that the language "proof and ultimate factors" in the proposal for new paragraphs (d) and (e) of § 25.979 be revised to be consistent with § 25.301. The FAA agrees that the terminology should be consistent and the section as adopted is reworded to use the term ultimate load.

One commentator questioned whether the design criteria for the pressure fueling system was applicable to fuel tanks and fuel tank vents. The proposed amendment to § 25.979 was not intended to apply to fuel tanks and vents. The section as adopted has been revised to make this clear.

Proposal 2–70. Several commentators questioned the meaning of the term "quick actuation drain valve" in proposed § 25.999(b)(3). The FAA agrees that the term may be subject to misinterpretation and that the provision is complete without the words "quick actuation".

One commentator asserted that the proposed requirement in § 25.999(b)(3) that the drain valve not be damaged in the event of a landing with landing gear retracted was not a proper design specification since damage was beyond the control of the manufacturer. The FAA agrees that the language "so that it will not be damaged" is not proper for this requirement, but the FAA believes that the valve, the location of the valve, or both, can be designed to prevent fuel spillage, assuming that a landing is made with the landing gear retracted. The section as adopted has been revised to clarify this intent.

Proposal 2–71. One commentator suggested that proposed § 25.1027(d) be revised to limit the design consideration to sludge or other foreign matter entering the feathering system from the oil tank. The FAA disagrees. Design consideration and flexibility should not be limited to preventing entry of material into the feathering system. All sources of sludge and foreign matter must be considered since the purpose of the regulation is the safe operation of the propeller feathering system. The proposal, therefore is adopted without substantive change.

Proposal 2–72. One commentator suggested that the word "critical" be added before the language "ground, water, and flight operating conditions" in the proposal for § 25.1041, but no reason was given.

proposal as adopted has been structured the same as the previous paragraphs.

Proposal 2–75. One commentator objected to the proposed lead-in for § 25.1125 that limited the applicability of the section to reciprocating engines. The FAA does not believe that the requirements of this section are applicable to other than reciprocating engine powered airplanes. While some early turbine powered airplanes have had an ejector installation in the exhaust stream to pull cooling air through the nacelle, the FAA does not consider this to be an exhaust heat exchanger within the meaning of the language of § 25.1125. Therefore, the proposed lead-in for § 25.1125 is adopted without substantive change.

Proposed § 25.1125(a)(3) is withdrawn. For a discussion of the withdrawal, see Proposal 2–29.

Proposal 2–76. A commentator stated that the phrase "automatically controlled with relation to the amount of power produced by the engine" in proposed § 25.1143(d) is not appropriate for all fluid injection systems. The FAA agrees that the phrase is not appropriate for certain turbine engine powered airplanes and that further revision of § 25.1143(d) should be considered. Proposed § 25.1143(d) has therefore been withdrawn for further study.

No unfavorable comment was received concerning proposed § 25.1143(e) and this paragraph has been adopted without substantive change.

Proposal 2–77. No unfavorable comments were received on the proposal to add a new § 25.1167. Accordingly, the proposal is adopted without substantive change.

Proposal 2–78. No unfavorable comments were received on the proposal to amend § 25.1197(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2–79. One commentator suggested that proposed § 25.1303(a)(2) be revised to clarify the method of clock indication which would be permitted under the regulation. The FAA agrees that the intent of the proposal was only to recognize the development of accurate digital clocks and that the minimum information presented should be the same. Proposed §§ 25.1303(a)(2) and 29.1303(d) as adopted are revised tc make this clear.

Proposal 2–8O. Several commentators suggested that the proposed change to § 25.1305 be revised to except anti-detonant injection (ADI) systems from the powerplant instrument proposal for fluid augmentation systems. The commentators expressed the opinion that the proposal for § 25.1143(d) concerning automatic controls for fluid injection systems (other than fuel) eliminated the need for a powerplant instrument for the ADI system. The FAA believes that the flight crew should be able to monitor the proper functioning of any fluid system that is used for thrust or power augmentation and the section as adopted is applicable to ADI systems. However, the section has been clarified to ensure application only to fluids systems that are used for thrust or power augmentation.

Proposal 2–81. No unfavorable comments were received on the proposal to amend § 25.1309. Accordingly, the proposal is adopted without substantive change.

Proposal 2–82. One commentator questioned the proposed color standardization of warning, caution, and advisory lights in new § 25.1322. The commentator stated "arbitrary standards for specific light colors cannot always be stated" because of the design objective to minimize red lights that require immediate crew action and of the need to consider past experience, test, crew acceptance, and the specific application. The FAA agrees that considerations other than the need for standardization of light colors may dominate in special circumstances, and the section as adopted provides for approval by the Administrator of light colors that are different than the standard. As stated by the commentator and in the section as adopted, a design objective is to have red warning lights only if a hazard is to be indicated which may require immediate corrective action.

One commentator noted that the language "warning light" is used in other sections of the regulations, such as § 25.812(e)(2), and a hazard which may require Immediate corrective action will not be indicated.

Proposal 2–83. For comments related to the deletion of paragraph [illegible] 35.

Proposal 2–84. The proposed change to § 25.1329 concerning the redesignation of § 25.1329 as § 25.1311 and the addition of provisions for automatic flight control systems is related to a proposed amendment to § 25.1329 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75–23; 40 FR 23048, May 27, 1975). The proposed amendment to § 25.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. Comments submitted for Proposal 2–84 will be considered at that time.

Proposal 2–85. Proposed § 25.1331(a)(2) concerning instruments using a power supply is related to proposed amendments to §§ 25.1331 and 25.1333 that are contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposed amendment to § 25.1331(a)(2) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposals in Notice 75–23. Comments submitted for Proposal 2–85 will be considered at that time.

Proposal 2–86. Proposed § 25.1337(a) concerning auxiliary power unit instrument lines is related to a proposed amendment to § 25.1337(a) that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75–19; 40 FR 21866; May 18, 1975). The proposed amendment to § 25.1337(a) contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–19. Comments submitted for Proposal 2–86 will be considered at that time.

Proposal 2–87. Proposed § 25.1353(c)(5) is related to a proposed amendment to § 25.1585 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 25.1353(c)(5) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–87 will be considered at that time.

Proposal 2–88. No unfavorable comments were received on the proposal to amend § 25.1355(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–89. Several commentators suggested that the list of factors to consider for locating forward and rear position lights in proposed §§ 23.1385, 25.1385, 27.1385, and 29.1385 was incomplete.

Two commentators also suggested that proposed §§ 23.1385(c) and 25.1385(c) be revised to permit a new position light to be installed on each wing tip. The FAA agrees that further study is necessary to develop factors of general applicability for position lights on all aircraft but that a rear position light as far aft as practical on each wing tip of an airplane is a reasonable alternative location. Accordingly, proposed §§ 23.1385(c) and 25.1385(c) have been revised. The proposals concerning the list of factors to be considered for locating forward and rear position lights in § 25.1385 and paralleled in proposed §§ 23.1385, 27.1385, and 29.1385 are withdrawn. However, the deletion of the passing light requirement from current § 25.1385(e) will be made.

Proposal 2–90. One commentator asserted that proposed new § 25.1403 was an operating requirement, not an airworthiness requirement and therefore was not appropriate for Part 25. Although a similar requirement currently exists in § 121.341(b), the FAA believes that such a requirement should be applicable to all newly certificated transport category airplanes.

Two commentators pointed out that the proposal differs from § 121.341(b) in that the proposal was not limited to the area of the wings that are critical from the standpoint of ice accumulation. The FAA agrees, and the section as adopted has been revised accordingly.

A comment was also received that expressed the belief that under the proposal, illumination or other means of ice detection would not be necessary if the wing was shown to have acceptable ice

Proposal 2–92. No unfavorable comments were received on the proposal to amend § 25.1515. Accordingly, the proposal is adopted without substantive change.

Proposal 2–93. No unfavorable comments were received on the proposal to amend the heading of § 25.1533 and on the proposal to amend § 25.1533(a). Accordingly, this amendment is adopted without substantive change. For comments related to the withdrawal of the proposed new § 25.1533(c), see Proposal 2–49.

Proposal 2–94. The proposed change to § 25.1549 concerning the marking requirements for powerplant instruments is related to a proposed amendment to § 25.1549 that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75–19; 40 FR 21866; May 19, 1975). The proposed amendment to § 25.1549 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–19. Comments submitted for Proposal 2–94 will be considered at that time.

Proposal 2–95. One commentator took exception to the proposed deletion of the requirement for marking fuel and oil tank capacities at the filler openings in § 25.1557(b). The FAA believes this method of providing the usable fuel tank capacity and the oil tank capacity is no longer necessary. The pilot has the fuel quantity gage and the Airplane Flight Manual, and the servicing personnel usually have no interest in the usable fuel tank capacity. The determination of oil level in oil tanks is usually accomplished with the dipstick. Accordingly, the proposal is adopted without substantive change.

Proposal 2–96. The proposed change to § 25.1581 concerning the Airplane Flight Manual is related to proposed amendment § 25.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 25.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–96 will be considered at that time.

Proposal 2–97. No unfavorable comments were received on the proposal to amend § 25.1583. Accordingly, the proposal is adopted without substantive change.

Proposal 2–98. The proposed change to § 25.1587 concerning performance information is related to a proposed amendment to § 25.1587 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 25.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–98 will be considered at that time.

Proposal 2–99. Two commentators questioned the applicability of proposed § 27.25(c) concerning a total weight that was greater than the maximum weight established under § 27.25(a) and noted that a clarification of the applicable flight requirements was needed. The FAA agrees that proposed § 27.25(c) should be clarified. Proposed §§ 27.25(c) and 29.25(c) are intended to provide only a total weight standard for approving the rotorcraft structure for rotorcraft that will be operated under Part 133. Proposed §§ 27.25(c) and 29.25(c) as adopted have been revised to clarify this intent.

Proposal 2–100. Proposed § 27.65(a)(2)(i) concerning climb gradients for rotorcraft other than helicopters is related to a proposed new § 27.1587(b)(3) that is contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75–10; 40 FR 10802; March 7, 1975). The proposed amendment to § 27.1587 contained in Notice 75–1O is being deferred; see Proposal 2–140. Therefore, the proposed amendment to § 27.65 contained in Notice 75–10 is also deferred until final rulemaking action is taken with respect to the related proposal for § 27.1587. Comments submitted for proposal 2–100 will be considered at that time.

Proposal 2–101. No unfavorable comments were received on the proposal to amend § 27.141. Accordingly, the proposal is adopted without substantive change.

Proposal 2–106. Two commentators suggested that the limit pilot torque for rotorcraft twist controls in proposed §§ 27.397(b)(2) and 29.397(b)(2) should be 80 times the radius (R) in inches instead of 133 inch-pounds, as proposed. The FAA agrees that the pilot torque load requirements should be a function of the radius (R). Also the FAA does not expect the radius (R) of any twist control installed on any rotorcraft type certificated in the future to be greater than 133/80 inches. Therefore, the proposals as adopted revise the limit pilot torque load to 80R inch-pounds.

Proposal 2–107. No unfavorable comments were received on the proposal to add a new § 27.563. Accordingly, the proposal is adopted without substantive change.

Proposal 2–108. No unfavorable comments were received on the proposal to amend § 27.603. Accordingly, the proposal is adopted without substantive change.

Proposal 2–109. One commentator disagreed with proposed §§ 27.685(a) and 29.685(a) that would require the consideration of the effects of the freezing of moisture on control systems since §§ 27.685(a) and 29.685(a) currently require that control systems be designed to prevent jamming. While the explanation for this proposal indicated that the freezing of moisture was a common cause of control jamming, the proposal is also directed at preventing chafing and interference caused by the freezing of moisture. Accordingly, the proposals are adopted without substantive change.

Proposal 2–110. No unfavorable comments were received on the proposal to add a new § 27.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–111. Based on a comment received, the proposed change to ,§ 27.787 has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2–112. No unfavorable comments were received on the proposal to add a new § 27.801. Accordingly, the proposal is adopted without substantive change.

Proposal 2–113. Several commentators stated that the ditching emergency exit standards proposed for §§ 27.807(d) and 29.807 should not be applicable to all rotorcraft. The commentators noted that the new standards would unnecessarily penalize rotorcraft that would never be involved in a ditching situation. The FAA agrees that certain rotorcraft may not operate in areas where ditching is a concern. Compliance with the ditching emergency exit standards should not be required for all rotorcraft during type certification. Therefore, the proposals as adopted have been revised to make it applicable only to rotorcraft for which ditching certification is requested. The overhead hatch requirements proposed in new §§ 27.807(d)(2) and 29.807(d)(3) are withdrawn because of the possible hazards associated with a turning main rotor. In addition, the reference in proposed § 27.807(d) to § 27.807(a) has been deleted as unnecessary, and the reference in proposed § 29.807(d) to § 20.807(c) has been deleted as inappropriate.

Proposal 2–114. For comments related to the proposed amendment of § 27.853, see Proposal 2–18.

Proposal 2–115. Upon further FAA review proposed §§ 27.865(a) and 29.865(a) concerning external load attaching means have been revised to preclude the necessity of considering the application of an external load at angles that will not be obtained in service. One commentator objected to the requirement for a manual mechanical control for the quick-release device. The commentator stated that this requirement was too restrictive due to the other standby electrical systems available. The FAA does not agree. Contrary to the commentator's contention the reliability of controls other than manual mechanical controls have not been sufficiently substantiated to permit their use in place of a manual mechanical control.

Proposal 2–116. One commentator objected to the proposals to add new standards concerning turbine engine installations to §§ 27.903 and 29.903 that would be substantively identical to proposed § 23.903(b). The commentator requested that the proposals be withdrawn since helicopter service experience does not indicate that such a standard is necessary and due consideration has not been given to the differences between helicopter and airplane engine control systems. The FAA disagrees. While there are differences

§ 27.927 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–19. Comments submitted for Proposal 2–118 will be considered at that time.

Proposal 2–119. No unfavorable comments were received on the proposal to add a new § 27.939(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–120. No unfavorable comments were received on the proposal to amend § 27.977. Accordingly, the proposal is adopted withoutsubstantive change.

Proposal 2–121. Two commentators objected to the proposals to amend §§ 27.999(b) and 29.999(b) to require the installation of quick actuation type drain valves that are readily accessible, which can be easily opened and closed, and is either located or protected so that it will not be damaged in the event of a landing with landing gear retracted. The commentators stated that the requirement to include crash landing consideration is not considered appropriate since there are a great number of other areas which must be covered in crash landing conditions. The proposals, however, would require that the fuel system drain valves be either located or protected so that It will not be damaged in the event of a landing with landing gear retracted. There are no requirements in the proposal for consideration of crash landing conditions.

In consideration of comments discussed under Proposals 2–26, and 2–70, §§ 27.999(b)(3)(ii) and 29.999(b)(3)(ii), as adopted, have been clarified to more specifically provide a design consideration.

See Proposals 2–26 and 2–70.

Proposal 2–122. No unfavorable comments were received on the proposal to amend § 27.1043(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–123. No unfavorable comments were received on the proposal to add a new § 27.1093(c). The proposal as adopted has been editorially changed to agree with the format of the current section.

Proposal 2–124. No unfavorable comments were received on the proposal to add a new § 27.1123. Accordingly, the proposal is adopted without substantive change.

Proposal 2–125. No unfavorable comments were received on the proposal to add a new § 27.1143(d), and the proposal is adopted without substantive change. However, the heading of § 27.1143 has been amended to reflect the contents of the section after the adoption of a new paragraph (d).

Proposal 2–126. No unfavorable comments were received on the proposal to amend § 27.1185. Accordingly, the proposal is adopted without substantive change.

Proposal 2–127. For comments related to proposed amendment of § 27.1322, see Proposals 2–34 and 2–82.

Proposal 2–128. The proposed change to § 27.1325 concerning the static pressure sources is related to a proposed amendment to § 27.1325 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems. Proposals (Notice 723; 40 FR 23048; May 27, 1975). The proposed amendment to § 27.1325 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. Comments submitted for Proposal 2–128 will be considered at that time.

Proposal 2–129. The proposal for a new § 27.1329 concerning the standards for automatic pilot systems is related to a proposed new § 27.1311 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and System Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposal for § 27.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking is taken with respect to the related proposal in Notice 75–23. Comments for Proposal 2–129 will be considered at that time.

of the proposal, see Proposal 2–89.

Proposal 2–133. No unfavorable comments were received on the proposal to amend § 27.1411. Accordingly, the proposal is adopted without substantive change.

Proposal 2–134. No unfavorable comments were received on the proposal to amend 27.1415(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2–135. The proposed change to § 27.1545 concerning the V_{ae} requirements is related to a proposed amendment to § 27.1505 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 27.1545 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75. Comments submitted for Proposal 2–135 will be considered at that time.

Proposal 2–136. For comments related to the proposed amendment of § 27.1548, see Proposal 2–42.

Proposal 2–137. No unfavorable comments were received on the proposal to amend § 27.1555(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–138. No unfavorable comments were received on the proposal to amend § 27.1557(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–139. The proposed change to § 27.1581 concerning the Airplane Flight Manual is related to a proposed amendment to § 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 27.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–139 will be considered at that time.

Proposal 2–140. The proposed change to § 27.1587 is related to a proposed amendment to § 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 27.1587 contained in Notice No. 2 is therefore being deferred until final rule making action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–140 will be considered at that time.

Proposal 2–141. One commentator suggested that the proposed new § 28.25(c) provisions be limited to category B rotorcraft. However no reason for the suggestion was stated. The FAA knows of no reason why the proposed provisions should be limited to category B rotorcraft. One commentator questioned the applicability of proposed new § 29.25(c) and noted that a clarification of the applicable flight requirements was needed. For discussion of this and other comments related to the proposed new § 28.25(c), see Proposal 2–99.

Proposal 2–142. No unfavorable comments were received on the proposal to amend § 29.63. Accordingly, the proposal is adopted without substantive change.

Proposal 2–143. Several commentators recommended that § 28.67(a)(1) be revised by adding the term "at V_{TOSS}" following the words "feet per minute", and by deleting the phrase "without ground effect". Although paragraph (a)(1)(iv) of § 29.67 as proposed defines the speed to be used in meeting the climb requirements of § 28.67(a)(1) as the takeoff safety speed, the FAA does not believe that the term "V_{TOSS}" is appropriate. Also the FAA does not agree that the phrase "without ground effect" should be deleted from § 29.67(a)(1). The FAA requires that all climb performance be conducted outside the influence of ground effect. Accordingly, the proposal is adopted without substantive change.

Proposal 2–144. No unfavorable comments were received on the proposal to amend § 29.71. Accordingly, the proposal is adopted without substantive change.

Proposal 2–149. For comments related to the proposed amendment of § 28.397, see Proposal 2–106.

Proposal 2–150. No unfavorable comments were received on the proposal to add a new § 29.563. Accordingly, the proposal is adopted without substantive change.

Proposal 2–151. No unfavorable comments were received on the proposal to amend § 29.603. Accordingly, the proposal is adopted without substantive change.

Proposal 2–152. For comments related to the proposed amendment of § 29.685(a), see Proposal 2–109.

Proposal 2–159. No unfavorable comments were received on the proposal to add a new § 29.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–154. The proposed change to § 28.783 concerning the requirements applicable to "airstair doors" in transport category rotorcraft is related to proposed amendments to § 25.783 that are contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75–10; 40 FR 10802; March 7, 1975) and in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75–31; 40 FR 29410; July 11, 1975). The proposed amendment to § 25.783 contained in Notice 75–10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–31. The proposed amendment to § 29.783 contained in Notice 75–10 is therefore being deferred until final rulemaking action is taken with respect to the related proposal for § 25.783. Comments submitted for Proposal 2–154 will be considered at that time.

Proposal 2–155. No unfavorable comments were received on the proposed new § 29.787(d). However, based on a comment received on Proposal 2–111, this proposal has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2–156. No unfavorable comments were received on the proposal to add a new § 29.801. Accordingly, the proposal is adopted without substantive change.

Proposal 2–157. For comments related to the proposed amendment § 29.807, see Proposal 2–113.

Proposal 2–158. No unfavorable comments were received on the proposal to add a new § 29.813(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–159. One commentator objected to the proposed change to § 29.815 for the same reasons as presented for the proposed change to § 25.815. The discussion of § 25.815 in Proposal 2–62 deals with this comment.

Proposal 2–160. For comments related to the proposed amendment of § 29.853, see Proposal 2–18.

Proposal 2–161. For comments related to the proposed new § 29.865, see Proposal 2–115.

Proposal 2–162. No unfavorable comments were received on the proposal to amend § 29.903(c)(1). Accordingly, the proposal is adopted without substantive change. For comments related to the proposal to add new standards concerning turbine engine installation, see Proposals 2–19 and 2–116.

Proposal 2–163. The only public comment received in response to proposed §§ 27.917(d) and 29.917(a) recommended that the present language in § 28.917(a) be used but gave no reason for the recommendation. The FAA believes that there should be a positive description of the cooling fans that must be considered as part of the rotor drive system. Accordingly, the proposals are adopted without substantive change.

Proposal 2–164. The proposed change to § 29.927 concerning the torque transmission test time is related to a proposed amendment to § 29.927 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75–31; 40 FR

ingly, the proposal is adopted without substantive change. Also see proposal 2–88.

Proposal 2–168. No unfavorable comments were received on the proposal to amend § 29.997. Accordingly, the proposal is adopted without substantive change.

Proposal 2–169. Based on comments concerning proposed changes to § 25.979, proposed new paragraphs (d) and (e) of § 28.979 have also been revised. See Proposal 2–69 for a discussion of the amendment to § 25.979.

Proposal 2–170. One commentator objected to the proposal to § 29.999 on the basis that the helicopter accident records do not show "any great number due to operators not draining fuel sumps." The FAA believes that this low accident rate due to water contamination in the fuel exists because most helicopters already use quick actuation drain valves.

One commentator questioned the need for proposed § 29.999(b) noting that current § 29.971(d) appears to have the same requirement. The FAA agrees that current § 29.971(d) would be redundant for fuel tank sump drains and has therefore deleted the standards for the fuel tank sump drain in § 29.971(d).

The fuel drain standards in § 29.999(b) as proposed are applicable to each drain required by § 29.999(a) including the drains prescribed in § 29.971, but to avoid misinterpretation the section as adopted is clarified to specifically note the fuel tank sump drains prescribed in § 29.971.

Also see Proposals 2–26, 2–70, and 2–121.

Proposal 2–171. One commentator stated that proposed § 29.1041(a) should be revised to except "ground use only" auxiliary power units (APU's). The FAA disagrees. APD's that are permitted to operate only on the ground have inadvertently continued to operate in flight. Safe operation of APQ's requires consideration of ground, water, and flight operating conditions. The proposal is therefore, adopted without substantive change.

Proposal 2–172. No unfavorable comments were received on the proposals to amend § 29.1043(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–173. No unfavorable comments were received on the proposal to add a new § 29.1093(c). The proposal as adopted has been editorially changed to agree with the format of the current section.

Proposal 2–174. For comments related to the proposed amendment of § 29.1125, see Proposals 2–29 and 2–75.

Proposal 2–175. No unfavorable comment was received on the proposal to amend § 29.1143 and the proposal is adopted without substantive change. However, the heading of § 29.1143 has been amended to reflect the contents of the section after the addition of a new paragraph (e).

Proposal 2–176. No unfavorable comments were received on the proposal to amend § 29.1165(f). Accordingly, the proposal is adopted without substantive change.

Proposal 2–177. Two commentators objected to the selective use of Part 33 requirements in the proposal for a new § 29.1167 that would provide substantiation requirements for accessory gearboxes that are not certificated as part of an engine. The FAA proposed to amend Part 29 like Part 25 for consistency. The FAA now believes that the proposed new § 29.1167 is inappropriate in view of the requirements to substantiate the rotor drive system including gearboxes under the rotor drive system endurance test requirements. Therefore, proposed new § 29.1167 is withdrawn.

Proposal 2–178. No unfavorable comments were received on the proposal to amend § 29.1189(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2–179. No unfavorable comments were received on the proposal to amend § 29.1197(a). Accordingly, the proposal is adopted without substantive change.

to a proposed new § 29.1311 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75–23; 40 FR 23048; May 27, 1975)). The proposal for § 29.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. Comments submitted for Proposal 2–184 will be considered at that time.

Proposal 2–185. The proposed change to § 29.1337 concerning the auxiliary power unit instrument lines is related to a proposed amendment to § 29.1337 that is contained in Airworthiness Review Program, Notice No. 3 : Powerplant Proposals (Notice 75–19; 40 FR 21866, May 19, 1975). The proposed amendments to § 29.1337 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–19. Comments submitted for Proposal 2–185 will be considered at that time.

Proposal 2–186. Proposed § 29.1353(c)(5) concerning nickel-cadium batteries is related to a proposed amendment to § 29.1585 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 29.1353(c)(5) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–186 will be considered at that time.

Proposal 2–187. For comments related to the proposed amendment of § 29.1385 and the withdrawal of the proposal, see Proposal 2–89.

Proposal 2–188. The proposal for § 29.1545 concerning the V_{ne} requirements is related to a proposed amendment to § 29.1505 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 29.1545 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–188 will be considered at that time.

Proposal 2–189. For comments related to the proposed amendment of § 29.1549, see Proposal 2–42.

Proposal 2–190. No unfavorable comments were received on the proposal to amend § 29.1555(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–191. No unfavorable comments were received on the proposal to amend § 29.1557(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–192. The proposed change to § 29.1581 concerning the Airplane Flight Manual is related to a proposed amendment to § 29.1581 that is contained in Airworthlness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 29.1581 contained in Notice No. 2 is therefore being deferred until final rulemaklng action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–192 will be considered at that time.

Proposal 2–193. No unfavorable comments were received on the proposal to amend § 31.1. Accordingly, the proposal is adopted without substantive change.

Proposal 2–194. No unfavorable comments were received on the proposal to amend § 31.11 and 31.20. Accordingly, the proposal is adopted without substantive change.

Proposal 2–195. No unfavorable comment was received on the proposal to add a new § 31.14 concerning weight limits of manned free balloons. Therefore, the section is adopted without substantive change.

Proposal 2–196. No unfavorable comments were received on the proposal to amend § 31.45. Accordingly, the proopsal is adopted without substantive change.

Proposal 2–197. No unfavorable comments were received on the proposal to add a new § 31.46. Accordingly, the proposal is adopted without substantive change.

Proposal 2–202. No unfavorable comments were received on the proposal to amend § 35.39. Accordingly, the proposal is adopted without substantive change.

Proposal 2–203. No unfavorable comments were received on the proposal to amend § 35.41(e). Accordingly, the proposal is adopted without substantive change.

Proposal 2–204. No unfavorable comments were received on the proposal to amend § 35.45(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2–205. No unfavorable comments were received on the proposal to amend § 91.14. Accordingly, the proposal is adopted without substantive change.

Proposal 2–206. No unfavorable comments here received on the proposal to amend § 91.21(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2–207. One commentator suggested that the proposed change to § 91.33(d)(6) concerning clock requirements should use the language of § 121.305. The FAA believes that a standard should be specified in § 91.33(d)(6) for digital clocks and the proposal as adopted provides a specific standard. See Proposal 2–79.

Proposal 2–208. The intent of the proposed new § 91.193(g) is to require protective breathing equipment that would meet the standards proposed for § 25.1439(b) on certain airplanes operated under Part 91 Subpart D. Based on the current testing being conducted on this type of equipment, the FAA is developing new standards for a later rulemaking action. The proposal for § 25.1439(b)(2)(ii) is being withdrawn (See Proposal 2–91). Therefore, the FAA believes that the proposal for § 91.193 is premature, and the proposal is withdrawn.

Proposal 2–209. Although no unfavorable comment was received on the proposed revision of § 91.209, the FAA believes that revision of similar ice protection provision in § 135.85 may be necessary. Amendments to §§ 91.209 and 135.85 should be considered together. Therefore, the proposed change to § 91.209 is withdrawn.

Proposal 2–210. No unfavorable comments were received on the proposal to amend § 121.171(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2–211. No unfavorable comments were received on the proposal to amend § 121.199. Accordingly, the proposal is adopted without substantive change.

Proposal 2–212. No unfavorable comments were received on the proposal to amend §§ 121.331(b) and 121.333(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2–213. The intent of proposed § 121.337(d) is to require protective breathing equipment that would meet the proposed requirements of § 25.1439(b) installed in certain airplanes operated under Part 121. However, proposed § 25.1439(b)(2)(ii) is withdrawn in this notice. Based on the current testing being conducted on this type of equipment, the FAA is developing new standards for a later rulemaking action. The FAA therefore believes that the proposed change to § 121.337 is premature and the proposal is withdrawn. Also see Proposal 2–91.

Proposal 2–214. No unfavorable comments were received on the proposal to amend § 127.105. Accordingly, the proposal is adopted without substantive change.

Proposal 2–215. No unfavorable comments were received on the proposal to add a new § 127.106. Accordingly, the proposal is adopted without substantive change.

Proposal 2–216. One commentator objected to the proposed amendment to § 133.1. The commentator stated that the proposal specifically eliminates the reference to airworthiness certification rules when, in fact, Subpart D is retained intact except for the standards for external-load attaching means and quick-

Accordingly, the proposal is adopted without substantive change.

Proposal 2–220. No unfavorable comments were received on the proposal to amend § 135.71(a)(5). Accordingly, the proposal is adopted without substantive change.

Proposal 2–221. Based upon further review by the FAA, proposed § 135.165(b)(2) is being withdrawn because contrary to the explanation for the proposal in Notice 75–10, the proposal would result in unjustifiably different standards for transport category airplanes operated under Part 135 and those operated under Part 121.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425) ; sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, and for the reasons stated in Notice 75–10, Parts 21, 23, 25, 27, 29, 31, 33, 35, 91, 121, 127, 133, and 135 of the Federal Aviation Regulations are amended as follows, effective February 1, 1977.

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an inflation impact Statement under Executive Order 11821 and OMB Circular A–107.

Amendment 35–4

Airworthiness Review Program—Amendment No. 4:

Powerplant Amendments

Adopted: March 10, 1977 **Effective: May 2, 1977**

(Published in 42 FR 15034, March 17, 1977)

The purpose of these amendments is to update and improve the airworthiness standards applicable to the type certification of aircraft engines and propellers and of aircraft with respect to the provisions relating to powerplant installations.

These amendments are the fourth in a series of amendments to be issued as part of the Airworthiness Review Program. The following amendments have previously been issued as part of this Airworthiness Review Program:

Title	*FR Citation*
Form number and clarifying revisions.	40 FR 2576; Jan. 14, 1975.
Rotorcraft anticollision lights standards.	41 FR 5290; Feb. 5, 1976.
Miscellaneous amendments.	41 FR 55454; Dec. 20, 1976.

These amendments are based on two Notices of Proposed Rule Making—Notice 75–10 published in the FEDERAL REGISTER on March 7, 1975 (40 FR 10802); and Notice 75–19 published in the FEDERAL REGISTER on May 19, 1975 (40 FR 21866). The amendments based on Notice 75–10 were deferred in the series of amendments titled ''Miscellaneous Amendments'' (41 FR 55454; Dec. 20, 1976) so that they could be considered in conjunction with the final disposition of certain proposals in Notice 75–19. The discussions of the comments received for the deferred proposals are included under the heading of the related Notice 75–19 proposals.

a manifold pressure gauge for each sea level engine equipped with a constant speed propeller, as well as for each altitude engine. The commentator stated that such a sea level engine is capable of being overboosted, if operated with the propeller adjusted for operations at high beta angles and the throttle adjusted for high power. The FAA does not agree since a "Sea level engine" as defined would be capable of producing rated takeoff power only at sea level. Therefore, the definitions of "Altitude engine" and "Sea level engine" are adopted as proposed.

Proposal 3–2. Based upon a further review, proposed new § 23.739 concerning a requirement for landing gear electrical ground connections is withdrawn.

Proposal 3–3. One commentator questioned the proposed amendment of § 23.901(b)(2) concerning easily removable engine cowls and nacelles to facilitate preflight checks. The commentator was of the opinion that the preflight check made by the pilot should be limited to oil level inspection and suggested that the proposal be revised to only require provisions so that the pilot can easily check the level of lubrication oil. The FAA does not agree with the commentator. Items other than the oil level need to be checked in the engine compartment during a preflight check and therefore the engine cowls and nacelles must be easily removable or openable by the pilot to facilitate these checks.

Another commentator objected to the phrase "sustained loss of power" in proposed § 23.901(b)(3), as being insufficiently definitive by prescribing a limit on the duration of power loss rather than the degree of poker loss. The commentator suggested the use of the phrase "serious loss of power." The FAA does not agree. The phrase "sustained. loss of power is consistent with present § 33.77(c), and was selected since the ingestion of rain can cause a power loss that is acceptable if it is not sustained. The commentator also objected to the prescribed rate of rain ingestion as being more severe than is presently prescribed or proposed for turbine engines in Part 25. The rain ingestion rate of 4 percent of engine airflow by weight is presently prescribed for all turbine engines of new design in § 33.77(f). Contrary to the commentator's contention, proposed § 25.1091(e) would apply the same rate in Part 25 to turbine engine installations using engines type certificated under regulations that did not include the current Part 33 requirement. The FAA believes that the rain ingestion rate is a reasonable certification requirement and is consistent with current § 33.77(f).

The commentator stated further that the moisture content should be that specified in Part 25, Appendix C, or two percent water content by weight. However, Appendix C defines an icing cloud and not a rain condition.

The commentator also stated that sufficient information regarding the collection and recording of the test data has not been provided and would be necessary to meet the requirements. The FAA did not intend to include administrative or type certification procedures in the proposal. No difficulty has been experienced in this regard during the type certification testing of turbine engines and no difficulty is foreseen in applying the proposed requirement.

The proposal is revised editorially for clarity.

Proposal 3–4. No adverse comments were received with respect to proposed deletion of § 23.939(b). The proposal, therefore, is adopted.

Proposal 3–5. No unfavorable comment was received for proposed new § 23.943, and the proposal is adopted without substantive change. See Proposal 3–26 for a discussion of related comments.

Proposal 3–6. No unfavorable comments were received on the proposal to amend § 23.959. Accordingly, the proposal is adopted without substantive change.

Proposal 3–7. In commenting on proposed § 23.967(a)(5) one commentator stated that problems of fatigue of tanks should be examined where a negative pressure could exist in the tank. The proposal covers only. bladder cells and the FAA does not regard fatigue considerations to be pertinent to bladder cells. The proposal is editorially revised to ensure that the exception for zero or negative pressure is clear.

FAA believes the proposal is not clear and may cause a misinterpretation of current § 23.975(a). The proposal is therefore withdrawn.

Several commentators suggested revisions of § 23.975(a)(8). In light of the withdrawal of proposed paragraph (a)(8), these comments are not discussed.

Proposal 3–10. No unfavorable comments were received on the proposal to amend § 23.995. The proposal is revised editorially for clarity. Also see Proposal 3–13.

Proposal 3–11. For a discussion of comments related to proposed § 23.1093(b), see Proposal 3–34.

Proposal 3–12. A commentator objected to proposed § 23.1121(b) concerning the location and shielding of exhaust system parts because of a lack of specificity on how to determine whether the location of a system carrying flammable fluid is acceptable. The FAA did not intend to state how an acceptable location would be determined since a number of acceptable methods might exist. The commentator also pointed out the possibility that a shield located close to a hot component might become hot enough to ignite flammable fluid. The FAA agrees and proposed §§ 23.1121(b), 25.1121(d), 27.1121(d), and 29.1121(b) have been revised to make it clear that shields used for shielding exhaust system parts are also parts of the exhaust system. The commentator also questioned whether the flammable fluid leak sources to be considered are those around fittings or include those caused by rupture of a fluid carrying line. Proposed § 23.1121(b) covers any leakage from a flammable fluid system, including fluid-carrying lines and fittings, as well as the joints between them. Finally, the commentators stated that consideration should be given to fire detection and extinguishing equipment in showing compliance with proposed § 23.1121(b). The FAA does not agree since it is necessary to take steps to both prevent and control fires.

A commentator stated that proposed § 23.1121(b) would make an adequate design difficult to achieve and contended that the resultant design would be complex with an inherent lower reliability than a simple system. The FAA does not agree. The proposal specifically allows the use of exhaust system shielding as a method of avoiding impingement of flammable fluids. Therefore, the FAA believes the proposal would reduce design difficulties. The commentator also stated that it would be virtually impossible to prove whether the objective of the proposal had been met. The FAA does not foresee any difficulty in administering the requirement.

No unfavorable comments were received on the proposed new § 23.1121(h). Accordingly, the proposal is adopted without substantive change.

Proposal 3–13. A commentator noted that proposed § 23.1141(g)(1) would prohibit the use of a rotary type switch for selecting fuel supply from more than one tank, and suggested that the proposal be revised to read: "For manual valves, positive stops or in the case of fuel valves suitable index provisions, in the open and closed position." The FAA agrees and proposed §§ 23.1141(g)(1), 25.1141(f)(1), 27.1141(c)(1), and 29.1141(f)(1) are revised accordingly.

Several commentators concurred with proposed §§ 23.1141(g)(2) and 25.1141(f)(2) but believed that the pilot might not have a clear picture of the effect of valve position and recommended that the proposal be revised to require means to indicate proper valve operation to the flight crew. Another commentator stated that it is unnecessary to require indication of actual valve position with power-assisted valves and that it would be sufficient to indicate open and closed positions. Proposed §§ 23.1141(g)(2) and 25.1141(f)(2) were not intended to require an indication of the proper functioning of a power-assisted valve or to require an indication of each of the numerous possible valve positions. In addition, the proposal, as stated in the explanation, would recognize the acceptability of intransit light indicators. Therefore, proposed §§ 23.1141(g)(2), 25.1141(f)(2), 27.1141(c)(2), and 29.1141(f)(2) have been revised accordingly.

ment requirements. The FAA believes that both this proposal relating to fire containment and Proposal 3–16 relating to fire detection are necessary in light of service experience. The commentator also felt that the proposal should refer only to engines with mechanically driven superchargers and not to all supercharged engines. The FAA disagrees since there have been fires on supercharged engine installations other than those with mechanically driven superchargers and the proposal is applicable to all supercharged multiengine powered airplanes.

Another commentator questioned whether the reference in the proposal to supercharged engines was intended to include engines with turbo-superchargers. The term ''supercharged'' covers both mechanical and turbo-supercharged engines.

Proposal 3–16. One commentator requested that proposed new § 23.1203 concerning fire detector systems be revised to exclude turbocharged multiengine powered airplanes because these airplanes are not any more susceptible to fire than airplanes with sea level engines. The FAA disagrees. Service experience indicates that multiengine powered airplanes incorporating turbo-superchargers are more susceptible to fires than those that do not incorporate turbo-superchargers.

Another commentator opposed the proposal on the grounds that fire detection systems have not been shown to be necessary for general aviation aircraft and that the emphasis should be placed on fire prevention. The commentator also stated that there has been a history of false fire detection signals that have resulted in unscheduled landings and needless engine shut-downs. The FAA agrees that fire prevention is important and proposals have been made in the Airworthiness Review Program to enhance aircraft fire prevention capabilities. However, there is a need to require fire detection provisions so that early action can be taken if a fire occurs. Also, false fire warnings, associated with early detection systems on transport category airplanes, do not occur to an unacceptable degree in present detector systems which have the benefit of many years of service experience and technical improvements. The proposal is adopted with only minor editorial changes.

Proposal 3–17. For a discussion of the withdrawal of proposed § 23.1305(h), see Proposal 3–59.

For a discussion of comments on proposed § 23.1305(w) concerning fire warning indicators for those airplanes required to comply with § 23.1203, see Proposal 3–16.

Proposal 3–18. One commentator agreed with the intent of the proposal for § 23.1337 (a) concerning powerplant instruments and instrument lines that utilize flammable fluids, but suggested a number of changes to make the provision more specific. The FAA does not agree. Flexibility in the requirement is necessary to avoid creating unnecessary design restrictions. The commentator suggested that a fire extinguisher be specified for compliance with the proposed rule. The FAA does not agree. The intent of the proposal is to prevent the occurrence of a fire hazard.

Another commentator did not concur with the proposal on the grounds that §§ 23.853(d) and 23.993 adequately cover its intent and it would result in undue crowding in the cockpit area. The FAA disagrees. The proposal contains necessary provisions not covered by § 23.993 and deals with locations not covered by § 23.853(d). In addition, the FAA has no data to indicate that crowding in the cockpit area would result from the proposal.

Proposals 3–19 and 2–44. Proposed § 23.1557(e) was intended to implement the requirement in Proposal 3–2 and is withdrawn because of the withdrawal of that proposal.

Disposition of Proposal 2–44 to amend § 23.1557 (Notice 75–10) was deferred so that it could be considered in connection with Proposal 3–19. No unfavorable comment was received on Proposal 2–44. Accordingly, the proposal is adopted without substantive change.

Proposal 3–20. Based upon a further review, proposed new § 25.739 concerning a requirement for landing gear electrical ground connections is withdrawn.

One commentator believes that the proposal would make § 25.1309 inapplicable to powerplant or APU installations. The FAA disagrees; § 25.1309 would continue to apply to powerplant and APU installations.

Another commentator concurred with the proposal if, with respect to APUs, it is limited to those approved for use in flight. The FAA does not believe the proposal should be so limited since the failure or malfunction of an APU approved for use only on the ground could jeopardize safe operation on the ground and in flight. The proposal is adopted without substantive change.

Proposal 3–22. One commentator recommended revising proposed § 25.903(e)(2) to require only the establishment of an envelope that defines the inflight restart capability. The FAA disagrees since this recommendation would not explicitly require restart capability, which was the intent of the proposal and which the FAA believes is essential for safe operation.

Another commentator questioned the deletion of the fire resistant requirement for engine restarting from current § 25.903(c). The FAA believes, due to the very limited use of an engine after a fire in the engine, that the benefit of requiring the components of the restarting system to be fire resistant are slight. The FAA thus can no longer justify this requirement.

A commentator did not concur with proposed § 25.993(e)(3) because it provides for ignition but not for rotational capability sufficient for an engine start. The proposal however was not intended to require a power source for rotation where windmilllng speeds are too low for restarting. The proposal would provide the necessary electrical power for engine ignition whether or not the windmilling speed was adequate for an engine start. The proposal is adopted without substantive change.

Proposal 3–23. Several commentators believed the reference in proposed § 25.933(a) to engine idle forward thrust was misleading and that the word "forward" should be deleted. One commentator suggested the word "reverse" be used instead of "forward". However, the direction of the thrust produced by the engine is not pertinent to the proposal. The resultant thrust is controlled by the reverser position. Therefore, the word "forward" is deleted.

One of the commentators believed that the allowable engine thrust setting should be stated as a percent of maximum or in terms of aircraft performance. The commentator suggested "flight idle" be used in place of "idle". The proposal was intended to require the engine thrust to be reduced to the thrust produced at idle in flight and the proposal has been revised to specify flight idle. The same commentator believed the proposal could be interpreted to include the malfunction of all reversers and an unlimited combination of failure modes. The proposed lead-in paragraph (a) is revised to make it clear that consideration must be given to each reverser but only one reversal at a time.

Another commentator recommended that the proposal be revised to require the prevention of inadvertent thrust reversal in flight. The FAA disagrees. Section 25.1155 currently requires consideration of inadvertent operation for each reverse thrust control.

A commentator stated that present § 25.933(d) covers the proposal. The FAA does not agree. Proposed § 25.933(a) would apply to all cases of in-flight thrust reversal of a reverser intended for ground operation only. Section 25.933(d) on the other hand applies only to malfunctions of the thrust reverser system that affect directional control.

Another commentator suggested that the word "condition" at the end of the proposed paragraph (a)(2) should be changed to "position". The FAA agrees that the significant status of the reverser is its position and the proposal" is revised accordingly.

Finally, a commentator stated in view of the requirements in § 25.1155, proposed § 25.933(a) should be limited to systems failures. The FAA disagrees. The consequence of an in-flight thrust reversal is the same whether the reversal results from malfunction or the control is moved to the reverse position. Both situations have occurred in service and need consideration. The commentator also suggested replacing "possible" by "probable" in proposed § 25.933(a)(2) because "possible" does not define the limit of

as adopted is designated as § 25.945.

A commentator suggested that proposed § 25.941(b)(2) should be clarified by adding the word "maximum" before the language "operating pressure". The FAA agrees, and the proposal as adopted has been so clarified.

A commentator referring to proposed § 25.941(b)(3), stated that it is not necessary to specify how the venting should be done and suggested that the proposal be revised to require that the venting arrangements for each tank must perform their intended functions under any foreseeable conditions. While the FAA does not agree with the revision suggested by the commentator, the FAA does agree that the vent need not be from the "top" of the expansion space. If the venting is effective under "any normal flight condition" the vent could be located in other places in the expansion space. Proposed § 25.941(b)(3) is revised accordingly to allow the applicant any needed flexibility.

Another commentator on proposed paragraph (b)(3) stated that the proposal would preclude pressurization as a means of pumping. The FAA agrees. The proposal was not intended to preclude pressurization and is revised to apply only to vented tanks.

A commentator suggested a revision of proposed § 25.941(b)(4) that would require marking each tank filler cap to specify "usable tank capacity" rather than tank capacity. However, after further review the FAA does not believe a requirement for marking the cap with "tank capacity" or "usable tank capacity" is necessary and the requirement is deleted from the proposal.

Another commentator thought that placards should be treated separately from system design and that the proposal should be deleted because similar requirements for fuel and oil systems are being considered for deletion. The FAA believes that marking the tank fluid opening to identify the fluid to be used may avoid the inadvertent use of incorrect fluids.

One commentator stated that it is highly probable that the filler cap will not be large enough to indicate the required markings and that markings adjacent to the fluid filler cap should be allowed as is the case for § 25.1557(b). The FAA agrees and paragraph (b)(4) is revised to require marking at or near the filler cover.

On the basis of comments received and upon further review, the FAA believes that adoption of proposed § 25.941(b)(5) is not appropriate at this time and the proposal is withdrawn.

Another commentator believed that the proposal should be combined with § 25.963(e) to cover all fluid tanks. The FAA agrees that current § 25.963(e) should be combined with other augmentation system requirements but does not believe that augmentation system requirements and fuel tank requirements should be combined. Proposed § 25.941 and current § 25.963(e) are combined in a new § 25.945.

Finally, a commentator on the fuel-injection exclusion in proposed paragraph (d) questioned whether water-methanol as used on the Rolls-Royce Model 542 (Dart) would be regarded as a fuel. In the Dart application, the water-methanol system is not regarded as a fuel injection system. Therefore, the water-methanol system used on the Dart engine would not be excluded from the augmentation system requirements of § 25.945.

Proposal 3–26. Several commentators objected to proposed new § 25.943 concerning the effect of negative accelerations on engine and APU operation. One commentator recommended that the word "sustained" be used in place of the word "hazardous" in relation to which malfunctions need be considered under the proposed rules. The FAA disagrees since the significance of a malfunction is whether it is hazardous, irrespective of its duration.

A commentator did not concur with the proposal, stating that a differentiation is necessary between ground-use APUs and other APUs. The commentator apparently misinterpreted the proposal since the proposal explicitly applies to an APU only if it is approved for use in flight.

maneuver-time history of the particular aircraft type being evaluated within its flight envelope. The proposal is adopted without substantive change.

Proposal 3–27. A commentator objected to the list of factors in proposed § 25.952(a) concerning characteristics that a test article must have that is used to reproduce the general fuel system. The commentator stated that in many cases the list is not complete and therefore may be misleading. Upon further review the FAA agrees that the specific list of characteristics may not be appropriate in all cases. The FAA believes that revision of the proposal to require that the test article must reproduce the operating characteristics of the portion of the fuel system to be tested will allow appropriate flexibility in determining the tests that are necessary and will eliminate the need for the list of factors which are already included within the term ''operating characteristics''.

Several commentators believed that the proposed § 25.952(b) was too restrictive. One commentator suggested that paragraph (b) be revised to read ''The likely failure of any heat exchanger using fuel as one of its fluids may not result in a hazardous condition''. The FAA agrees that contamination of either fluid does not always result in a hazardous condition and the requirement need not be as restrictive as proposed. Proposed § 25.952(b) is revised accordingly.

One commentator also commented that proposed paragraph (b) should apply only to heat exchangers that are part of the airplane fuel system and that engine heat exchangers should be controlled by a similar requirement in Part 33. The FAA disagrees. The evaluation whether contamination or other likely failure could cause a hazardous condition can only be determined in a particular airplane installation. Therefore, the proposal is applicable to airplane-furnished and engine-furnished heat exchangers.

Proposal 3–28. One commentator questioned the proposed clarification of § 25.959. While the commentator agreed that unusable fuel supply should be determined under § 25.959 without considering fuel system component failures, the commentator believed that if a failure of a fuel system component would produce a greater amount of unusable fuel that fact must be determined in certification and made known to the operator. Fuel system component failures are not a required consideration under § 25.959. However, if the FAA determines that additional information is necessary for safe operation, this information must be furnished to the operator under the requirements of subpart G of Part 25. Accordingly,. the proposal is adopted without substantive change.

Proposal 3–29. One commentator stated that proposed § 25.963(f) did not contain a provision to ensure fuel flow if the regulator failed and that there should be a manual back up for the crew in the event of a system failure. The proposal was not intended to ensure continued fuel flow after a regulator failure. The required failsafe features are only intended to ensure the prevention of over-pressurization. The FAA, furthermore, does not believe that an additional requirement for a specific manual system has been justified. The proposal is revised to ensure this intent.

Two other commentators believed that an automatic regulating means or a mechanical pressure regulating device need not be required if there are fail-safe features to prevent excessive pressure buildup. The FAA agrees and the proposal is revised to require a means with fail-safe features to prevent the buildup of excessive pressure differential between the inside and outside of the tank.

Proposed § 25.1305(a)(9) concerning powerplant instruments would have required a means to check the operation of the automatic regulating means in proposed § 25.963(f). Since paragraph (f) as revised would not require a means to regulate fuel tank pressure, an instrument to check this operation should not be required. Therefore, proposed § 25.1305(a)(9) is withdrawn.

See Proposal 3–25 for discussion of the transfer of current § 25.963(e), concerning augmentation liquid tank capacity, to § 25.945(e).

Proposal 3–30.. One commentator interpreted § 25.965(d) to mean that only a pressure test is required for non-metallic fuel tanks. The commentator recommended that slosh testing be added to proposed new § 25.965(d) as a requirement for non-metallic tanks in transport category airplanes. The FAA does not

The FAA agrees with two commentators who stated that where a metal-to-metal bond is made between the airplane and the fueling equipment no need exists for separate electrical bonding of the fuel nozzle to the airplane fueling connection. The FAA believes that considering airplane and ground fueling systems being used today metal-to-metal contact will exist during pressure refueling. Therefore, the proposals are revised to except pressure fueling connection points from the fuel system electrical bonding provision.

Another commentator opposed the proposal on the grounds that there are no statistics to show that the present procedure is unsafe and that requiring special ground connections would increase cost and impose an unnecessary economic burden. The FAA does not concur because the flow rates associated with fueling without proper bonding can induce an electrostatic discharge sufficient to ignite fuel vapor.

A third commentator believed that a review of all fueling procedures should be conducted, in which the subject of grounding points would be one of several subjects to be considered, and that the review should be undertaken before any new rule affecting those procedures is adopted. The FAA agrees that an overall review of fueling procedure and equipment might be desirable; however, the FAA is not aware of any substantive reason to delay the adoption of the proposal with the change discussed above.

Proposal 3–32. No unfavorable comments were received on the proposal to amend § 25.995. Accordingly, the proposal is adopted without substantive change. Also see Proposal 3–39.

Proposal 3–33. One commentator questioned the proposed amendment to § 25.1091. The commentator stated that incorporating APU requirements into the propulsion engine requirements is confusing and unnecessary and that each APU would have to meet the propulsion engine foreign object ingestion test requirements for takeoff, flight idle, and cruise conditions although APUs do not undergo these conditions. The FAA agrees that paragraph (e) should not apply to APUs since foreign object ingestion by APUs is not considered to be a significant problem. However, the FAA believes that applicability of the other requirements to APUs is necessary for the reasons stated in the explanation for the proposal. The commentator also believed that to comply with proposed paragraph (e), the installed engine must repeat the ingestion test requirements of § 33.77. The FAA did not intend to require that the ingestion test requirements be repeated on engines that had already shown compliance with § 33.77. The FAA believes that the test required by § 33.77 during engine type certification adequately accounts for the effects of inlet ingestion on the powerplant installation. Proposed § 25.1091(e) is revised accordingly to apply only to turbine engines and to include only those engines that had not been shown during engine type certification to comply with § 33.77.

Another commentator recommended that proposed paragraph (e) be revised to require each turbine powerplant installation to "be consistent with the foreign object ingestion requirements of § 33.77." The FAA believes that the revised proposal attains the objective of the recommendation. The proposal is adopted with the revisions noted.

Proposal 3–34. Several comments were made on proposed §§ 23.1003 and 25.1003 that did not take into consideration Amendment Nos. 23–15 and 25–36, effective October 31, 1974. Proposals 3–11 and 3–14 proposed only a minor change to make it clear that the requirements of §§ 23.1093(b) and 25.1093(b), concerning ice accumulation cause by the ice and snow expected within the approved flight envelope, cover air inlet system components.

Proposed §§ 23.1093(b), 25.1093(b), 27.1093(b), and 29.1093(b) are modified by inserting the word "operate" in place of the words "function properly" for consistency in terminology with the current §§ 23.1093(b), 25.1093(b), 27.1093(b), and 29.1093(b).

ProposaL 3–35. The proposal for § 25.1103(d), concerning turbine engine air duct systems, is related to a proposed amendment to § 25.1103 that is contained in Airworthiness Review Program Notice No. 8 (Notice 75–31). The proposed amendment to § 25.1103(d), contained in Notice No. 3, is therefore

Proposal 3–37. One commentator agreed with the proposed amendment to § 25.1123 but preferred to see all APU requirements separately stated rather than combined with the requirements for propulsion engines. The FAA, however, believes that identical requirements should be in the same section unless the applicability needs further clarification. Since no need was shown by the commentator, the proposal is adopted without substantive change.

Proposal 3–38. In response to an inquiry in the explanation of proposed new § 25.1129, several commentators stated that the proposal was covered by proposed § 25.901(c). The FAA agrees and the proposal is withdrawn.

Proposal 3–39. Several commentators stated that proposed § 25.1141(f) should apply only to valves that are essential to the safe operation of the airplane. The FAA disagrees. If any power-assisted valve is used, the flight crew might rely on it and should have an indication of when the valve is in the fully open or fully closed position, or when it is moving between the fully open and fully closed position.

The same commentators noted that an indication that the valve has attained the selected position should be required. For discussion of this comment and revision of new §§ 25.1141(f) (1) and (2), see Proposal 3–13.

Proposal 3–40. Several commentators objected to proposed §§ 25.1145(c), 27.1145(b), and 29.1145(c), concerning groups of ignition switches. The commentators stated that these new requirements were not necessary for turbine engines that do not require continuous ignition. The FAA agrees, since inadvertent movement of the ignition switch would not affect the operation of such an engine once that engine has been starts Accordingly, §§ 23.1145(c), 25.1145(c), 27.1145(b), and 29.1145(c) are revised to except the ignition switches for these engines from the requirement to have a means to prevent inadvertent operation of the group of ignition switches.

Proposal 3–41. The proposed § 25.1195(b), concerning fire extinguisher discharge, is related to a proposed amendment to § 25.1195(b) that is contained in Airworthiness Review Program Notice No. 8 (Notice 75–31). The proposed amendment to § 25.1195(b) contained in Notice No. 3, is therefore deferred until final rule-making action with respect to the related proposal in Notice 75–31. Comments submitted for Proposal 3–41 will be considered at that time.

Proposal 3–42. No unfavorable comments were received on the proposal to amend § 25.1197. Accordingly, the proposal is adopted without substantive change.

Proposal 9–43. A commentator recommended a revision of the first sentence of proposed § 25.1199(b) concerning the location of pressure relief discharges of fire extinguishing agents. The commentator suggested that the discharge end be required to be located to avoid hazard to the airplane rather than damage. The FAA disagrees. The proposal is intended to provide for the consideration of damage such as corrosion that may be caused by the discharge of fire extinguishing agents. The commentator's suggestion would not clearly provide for such necessary consideration.

Proposal 3–44. One commentator questioned proposed § 25.1207. The commentator stated that analysis should not be permitted as the sole method of shoving compliance with the fire protection requirements. The FAA agrees that some of the requirements of §§ 25.1181 through 25.1203 may be complied with by analysis alone, while others require other methods of substantiation. Section 25.1207(d) is therefore revised to make clear that unless tests are specifically required in §§ 25.1181 through 25.1203 analysis is an acceptable method of shoving compliance.

Another commentator pointed out that proposed § 25.1207(b) as written would preclude the use of the Statham test to determine extinguisher agent concentrations in an actual fire zone, contrary to his understanding that the Statham test method is acceptable. The FAA agrees and proposed paragraph (b) is revised to specify "tests of components," instead of "bench fire tests of components."

No unfavorable comment was received on Proposal 3–46 and the proposal is adopted without substantive change.

Proposals 3–47 and 3–94. Disposition of Proposal 2–94 (Notice 75–10) to revise §§ 25.1549(a), (b), and (c) was deferred so that it could be considered in connection with Proposal 3–47, to amend § 25.1549(d).

One commentator concurred with Proposal 2–94, hut pointed out that while it accommodated vertical scale instruments it did not accommodate horizontal scale instruments. The FAA agrees, and § 25.1549 as adopted viii provide marking standards appropriate to circular, horizontal, and vertical scale power plant instruments

Another commentator believed that the proposal to provide specific requirements for marking vertical tape instruments, to provide for cockpit instrument standardization, is not appropriate for today's turbine engines. The commentator indicated the requirement could produce overlapping markings which could be misleading and, under certain operating conditions, could indicate that an unsafe condition is safe. The commentator recommended that markings for vertical tape engine instruments not be specified because such standardization is not in the best interest of safety. The FAA believes that overlap markings on tape instruments, similar to the overlap markings on round face instruments, will provide an adequate and safe presentation.

No unfavorable comment was received on Proposal 3–47, to amend § 25.1549(d) and the proposal is adopted without substantive change.

Proposal 3–48. Proposed § 25.1557(e) was intended to implement the requirement in Proposal 3–20 and is withdrawn because of the withdrawal of that proposal.

Proposal 3–49. No unfavorable comment was received on the proposal to amend § 25.1585. Accordingly, the proposal is adopted without substantive change.

ProposaL 3–50. One commentator objected to the proposed amendments to §§ 27.571(a) and 29.571(a). The commentator stated that the addition of the language "rotor drive systems between the engines and the rotor hubs" to the parenthetical description of flight structure is misleading and unnecessary. In support, the commentator suggested that the fatigue evaluation of the rotor drive system is accomplished upon compliance with §§ 27.923 or 29.923. The commentator's reply indicates (as was noted in the explanation for the proposals) the need for a clarification that the fatigue evaluation of §§ 27.571 and 29.571 includes portions of the rotor drive system. Sections 27.923 and 29.923 are primarily endurance test requirements, while §§ 27.571 and 29.571 are the fatigue evaluation requirements. It is therefore appropriate to include the rotor drive systems in the parenthetical description of the flight structure that must be included in the fatigue evaluation of §§ 27.571 or 29.571, as applicable.

Accordingly, the proposed amendments to §§ 27.571(a) and 29.571(a) are adopted without substantive change.

Proposal 3–51. One commentator objected to the proposed amendments to §§ 27.901(c)(1) and 29.901(b)(1)(i) that, if adopted, would require compliance with the engine installation instructions provided under § 33.5(a). The commentator stated that the installation instructions are apparently aimed at field information for the owner and in any case § 33.5 does not require that this information be provided until Just prior to engine certification in many cases. The commentator recommended that the requirement should not refer to § 33.5 but to specific engine installation parameters which are essential to proper engine performance and which are exclusively the responsibility of the engine manufacturer.

The installation instructions of § 33.5(a), in general, include a description of the location of mounting attachments and methods of attachment of the engine and engine components. The FAA believes this information is particularly pertinent to rotorcraft type certification. The FAA further believes that the installation instructions will be prepared by the engine type certificate applicant at the early stages of the engine type certification program. The commentator's suggestion that specific engine installation param-

the proposed paragraphs are inconsistent. Proposed paragraph (b) would require that the rotor drive system and controls on all rotorcraft be tested for not less than 100 hours, and proposed paragraphs (c) through (e) would merely establish the binds of tests included in those 100 hours. Proposed paragraph (j), which would apply only to rotorcraft for which the use of minute power is requested, would require testing in addition to the 100 hours.

Another commentator stated that the FAA should not "bother with the change from 'power' to 'torque' as it leads to very confusing wording". The change of language to "torque" and "speed" was proposed because the FAA believes these are the parameters generally used by applicants in conducting the rotor drive system tests. The additional reference in the proposal to power, e.g., the 2½ minute and 30-minute power runs specified in paragraphs (e) and (j), is made to establish the relationship between the torque and speed and the corresponding engine power rating.

A commentator considered the cyclic aspect of testing to be important and suggested that the proposal specify the number and duration of cycles rather than the overall time. The FAA disagrees. The proposal does not change the terms of current § 27.923(f) which provides flexibility in establishing testing intervals (cycles). The FAA is not aware of a problem that would Justify changing these minimum test intervals.

The same commentator also believed the proposed test runs at 2 ½ minute and 3 minute power were inadequate and compared poorly with the test required to qualify the engine under Part 33. The FAA disagrees. As stated in the explanation, the 2½ minute and 30-minute power test in the proposal for a normal category rotorcraft is to demonstrate that the rotor drive system can absorb the torque of engines operating at 2½ minute and 30-minute power. These ratings, however, are not incorporated into the performance requirements as is the case under Part 29, for transport category rotorcraft, and no performance credit is realized from their use. Therefore, the FAA believes the test is adequate under Part 27.

Proposals 3–53 and 2–118. Proposal 2–118 was deferred so that it could be considered with Proposal since both proposed to amend § 27.927(b)(2). Proposal 2–118 would changé the words "one hour" in § 27.927(b)(2) to "fifteen minutes". In this connection a commentator asked if due consideration had been given to the 30 minute emergency power rating when establishing the time requirement. The 3 minute power is taken into account by the terms of the requirement for test at maximum torque attainable under probable operating conditions.

Two commentators to Proposal 3–53 believed that in proposed § 27.927(b)(2) the word "outputs" should be "Inputs". The FAA agrees and the proposal is revised accordingly.

One commentator stated that the 15-minute duration specified in proposed § 27.927(c), concerning operation after loss of oil pressure, should be 5 minutes to bring it into line with the protection time specified in current § 27.861. The FAA does not agree. The. 5-minute duration is specified in § 27.861 since the occurrence of a fire normally necessitates immediate descent and landing. loss of oil pressure in the rotor drive system does not correspondingly necessitate immediate descent and landing. The 15-minute requirement would provide for a reasonable durability of the system following the loss of oil pressure.

Two commentators believed that in proposed § 27.927(c) the term "autorotative conditions" was vague and should be replaced with the term "the low power conditions of autorotative flight". The FAA does not agree. Under autorotative conditions no power is transmitted from the engine to the rotor blades. Therefore a low power condition of the engine would not be applicable.

A commentator believed that the use of the word "torgue" in place of "power" was confusing. The commentator indicated that the proposal could be interpreted to permit a static test since only torque and no rotational speed is specified. The proposal to use the word "torque" was made since the tests ere run on the basis of the torque absorbed by the rotors. The torque being absorbed is that produced by the operating engine and transmitted through the rotor drive system.

Proposal 3–55. Several commentators to the proposed amendment of §§ 27.1093(b) and 29.1093(b) apparently failed to note the changes made by Amendment Nos. 27–9 and 29–10 (39 FR 35452; October 1, 1974). The proposals intended only to add the language "and its air inlet system" to §§ 27.1093(b)(1) and 29.1093(b)(1) and to structure both sections to incorporate the added language. For a discussion of a change made to proposed § 27.1093(b), see Proposal 3–34.

Proposal 3–56. One commentator stated that § 27.1121(d), unlike §§ 23.1121(b) and 29.1121(b), did not need the clarification proposed. The FAA agrees that § 27.1121(d) did not use the language "dangerously close" that had been an administrative problem in §§ 23.1121(b) and 29.1121(b). However, beside the desire for consistency among the airworthiness certification parts, the FAA believes that proposed § 27.1121(d) provides a more comprehensive standard and will allow greater design flexibility.

For a discussion of changes made to proposed § 27.1121(d), see Proposal 3–12. No unfavorable comments were received concerning proposed § 27.1121(g) and it is adopted without substantive change.

Proposal 3–57. A commentator objected to proposed § 27.1141(d). The commentator stated that this proposal was not deemed necessary for Part 29 and asked why it was necessary for Part 27. The FAA disagrees that a similar requirement was not deemed necessary for Part 29. Proposed § 29.901(c) that is adopted in this amendment will require a similar consideration for powerplant controls in transport category rotorcraft. Further, the FAA believes that this requirement is necessary for normal category rotorcraft. Many turbine powerplant control systems on normal category rotorcraft are inherently complex. Considering such complexity, the FAA believes that consideration bust be given to system redundancy, alternate devices, and duplication of functions in the design of certain turbine powerplant control systems.

Another commentator stated that the proposal to add a new § 27.1141(c) would require position indicators for all powerplant controls and considered this to be an excessive and unnecessary requirement. The FAA disagrees. The proposed new § 27.1141 (c) applies only to powerplant valve controls located in the cockpit. For discussion of the revision of new §§ 27.1141(c) (1) and (2), see Proposal 3–13.

Proposal 3–58. One commentator stated that the proposed changes to §§ 27.1145(b) and 29.1145(c), concerning the prevention of inadvertent operation of each group of ignition switches, would seem to contradict current §§ 27.1145(a) and 29.1145(b). Sections 27.1145(a) and 29.1145(b) require a means to quickly shut off all ignition by the grouping of switches or by a master ignition control. The FAA believes that the means provided to prevent inadvertent operation can be designed so that it will not prevent or adversely affect the ability to quickly shut off all ignition.

See Proposal 3–40 for a discussion of the revision of proposed § 27.1145(b) to provide an exception for turbine engines that do not require continuous ignition.

Proposal 3–59. A commentator stated that the revisions proposed for §§ 27.1305(e) and 29.1305(a)(5), concerning altitude engines, are not needed since the current rules are clear. The FAA believes that, considering the proposed new definition for an "altitude engine" that is adopted as an amendment to § 1.1 in this document, the proposed revisions concerning altitude engines in the airworthiness rules are not needed. The term "altitude engine" that is used in §§ 23.1305(h), 27.1305(e), and 29.1305(a)(5) will Include a derated engine as well as a supercharged engine after the amendment to § 1.1. Accordingly, proposed §§ 23.1305(h), 27.1305(e), 29.1305(a)(5) are withdrawn.

Proposal 3–60. No unfavorable comments were received on the proposal to amend § 27.1337(a). Accordingly, the proposal is adopted without substantive change. Also see Proposal 3–18.

Proposal 3–61. For a discussion of a comment concerning § 29.571(a), see Proposal 3–50.

Proposal 3–62. A commentator stated that proposed §§ 29.901(b)(1)(iii) and (c) are redundant and unnecessary. The FAA agrees that proposed § 29.901(b)(1)(iii) is unnecessary, and it is withdrawn. The FAA does not agree that proposed § 29.901(c) is redundant and unnecessary. Experience has shown the need for a failure requirement that is explicitly applicable to powerplant and auxiliary power unit installations.

Proposal 3–63. No unfavorable comment was received on the proposed deletion of paragraphs (d) and (e) in § 29.903, and the paragraphs are deleted. Also, see Proposal 3–64.

Proposal 3–64. A commentator, while generally agreeing with proposed new § 29.908, objected to its applicability to the entire cooling fan. The commentator stated that there is no service or test history that indicates a need to consider the entire fan. The FAA believes that the absence of cooling fan failures is due to the requirements of current § 29.1461 which applies to cooling fans that incorporate high energy rotors. In view of the requirements of current § 29.1461 and the fact that there is no service experience of fan failures, the FAA considers that proposed § 29.908 should be revised to be applicable only to cooling fan blade failures. Proposed § 29.908 is revised accordingly.

A commentator stated that loss of cooling may affect the continued safe operation of one or more engines and so prevent continued safe flight. The FAA did not intend to consider the effect of cooling loss but is concerned only with the fragmentation effect of a fan blade failure.

Proposal 3–65. A commentator believed the specification of 15 minutes in proposed § 29.927(c), concerning the loss of rotor drive system oil pressure, was inadequate for category A helicopters which have engine-out capability. Therefore, the commentator indicated, operations are planned over routes where a landing may not be possible within 15 minutes. The intent of the proposal is to enable the pilot to make an autorotative landing after loss of rotor drive system oil pressure and the FAA believes that the proposed 15 minute requirement is adequate for that purpose.

For a discussion of other comments related to proposed § 29.927(c), see the discussion of Proposal 3–53.

Proposal 3–66. A commentator stated that under his interpretation of § 29.965 only a pressure test is required for non-metallic fuel tanks, and be also recommended that slosh testing of non-metallic tanks be added as a requirement. The FAA disagrees. Paragraphs (a), (b), and (c) of § 29.965 apply prescribed pressure tests to all fuel tanks. In addition, § 29.965(d) already applies the slosh test requirement to each tank with large unsupported or unstiffened flat areas, or with other features whose failure or deformation could cause leakage. The proposal is adopted without substanve change.

Proposal 3–67. No unfavorable comments were received on the proposal to amend § 29.991(b). Accordingly, the proposal is adopted without substantive change.

Proposal 3–68. No unfavorable comments were received on the proposal to amend § 29.995. Accordingly, the proposal is adopted without substantive change.

Proposal 3–69. Although there were no unfavorable comments to the proposed amendment of § 29.1093(b) concerning the addition of the inlet system to the consideration required in paragraph (b)(1), the proposal is revised based on a comment to Proposal 3–34. See the discussion for Proposal 3–34.

Proposal 3–70. For a discussion of the revision to § 29.1121(b), see Proposal 3–12.

Proposal 3–71. Although there were no unfavorable comments to proposed § 29.1141 (f), the proposal is revised based on a comment to Proposal 3–13. See the discussion for Proposals 3–13 and 3–57.

Proposal 3–72. For a discussion of proposed § 29.1145(c), see Proposals 3–40 and 3–58.

Proposal 3–73. Two commentators objected to the proposal to amend § 29.1193(e) on the grounds that present fire protection requirements for category B rotorcraft are adequate and that the proposal would place an undue weight and cost burden on cats gory B rotorcraft. The FAA disagrees. Service experience has shown that the fire protection requirements specified in § 29.1193(e) should apply to all category of rotorcraft, especially those that may not be required to have fire extinguishing and fire detection systems. The FAA believes that the increase in cost and weight associated with this requirement is Justified by the increment of safety attained. The proposal is therefore adopted without substantive change.a

Proposals 3–78 and 2–185. Disposition of Proposal 2–185 (Notice 75–10) to amend § 29.1337(a) was deferred so that it could be considered in connection with proposal 3–78, which is also a proposal to amend § 29.1337(a). No unfavorable comment was received on either proposal. Accordingly, the proposals are adopted without substantive change.

Proposal 3–79. No unfavorable comments were received on the proposal to amend § 33.15. Accordingly, the proposal is adopted without substantive change.

Proposal 3–80. No unfavorable comments were received on the proposal to amend § 33.17. Accordingly, the proposal is adopted without substantive change.

Proposal 3–81. No unfavorable comments were received on the proposal to amend § 35.17. Accordingly, the proposal is adopted without substantive change.

Proposal 3–82. No unfavorable comments were received on the proposal to amend § 35.35. Accordingly, the proposal is adopted without substantive change.

These amendments are made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, and for the reasons stated in Notices 75–10 and 75–19, Parts 1, 23, 25, 27, 29, 33, and 35 of the Federal Aviation Regulations are amended as follows, effective May 2, 1977.

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an inflation impact Statement under Executive Order 11821 and OMB Circular A–107.

Amendment 35–5

Airworthiness Review Program—Amendment No. 8A: Aircraft, Engine, and Propeller Airworthiness, and Procedural Amendments

Adopted: August 27, 1980 **Effective: October 14, 1980**

(Published in 45 FR 60154, September 11, 1980)

SUMMARY: These amendments to the Federal Aviation Regulations update and improve the airworthiness standards applicable to the type certification of aircraft, engines, propellers, related operating rules, and procedural requirements. These amendments are part of the Airworthiness Review Program.

FOR FURTHER INFORMATION CONTACT: Marvin J. Walker, Regulatory Review Branch, AVS–22, Safety Regulations Staff, Associate Administrator for Aviation Standards, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, D.C. 20591, Telephone: (202) 755–8714.

SUPPLEMENTARY INFORMATION:

These amendments are the ninth and last in a series of amendments issued as part of the Airworthiness Review Program. The following amendments have previously been issued as part of this program:

Title and FEDERAL REGISTER (FR) Citation

Amendment No. 1: Form Number and Clarifying Revisions (40 FR 2576; Jan. 14, 1975)

Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978)

Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; Feb. 4, 1980)

These amendments are for the most part based on Notice 75–31 which was published in the FEDERAL REGISTER on July 11, 1975 (40 FR 29410), as well as a number of proposals contained in the following notices of prosed rule making: Notice 75–10 (40 FR 10802; March 7, 1975); Notice 75–19 (40 FR 21866; May 19, 1975); and Notice 75–26 (40 FR 24802; June 10, 1975). Amendments based on the latter three notices have already been issued as a part of the Airworthiness Review Program, specifically those titled Miscellaneous Amendments, Powerplant Amendments, and Airframe Amendments, respectively. Final action on certain of the proposals was deferred, however, at the time the amendments were issued as further consideration and review of these proposals was considered necessary. In other cases, final action was deferred so that they could be considered together with related proposals contained in other notices.

Certain proposals identified as Group 2 in Appendix I to Notice 75–31 were deferred to be dealt with in a later notice as a part of the Airworthiness Review Program. These proposals all addressed the concept of periodically updating the certification basis of airplane models in long-term production. Such recertification every five or ten years would be intended to ensure that the level of safety of all airplanes in service keep pace with the current level of safety expectations. The FAA has now determined that these proposals more appropriately should be examined as a separate issue in a future regulatory action. Accordingly, the proposals identified as Group 2 in Appendix 1 to Notice 75–31 are being dropped from the Airworthiness Review Program.

Proposals relating to cabin safety and flight attendants, which are identified in this amendment, were extracted from Notice 75–31 (40 FR 29410; July 11, 1975) and handled on an expedited basis. Those rules were published in the Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Interested persons have been given an opportunity to participate in the making of these amendments and due consideration has been given to all matters presented. The proposals and comments are discussed below. Substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon relevant comments received and further review within the FAA. Except for minor editorial and clarifying changes and the substantive changes discussed below, these amendments and the reasons for them are the same as those contained in Notices 75–10, 75–19, 75–26, and 75–31.

Discussion of Comments

The following discussions are keyed to the like-numbered proposals contained in Notices 75–10, 75–19, 75–26, and 75–31, and are presented in the same order as the corresponding amendments found in the rules portion of this document.

Proposal 8–2. The proposal to amend § 1.1 in order to transfer the definitions for rated power and thrust to a new § 33.6 is withdrawn. It is considered that such a change may introduce confusion in the administration of aircraft certification rules. See also Proposal 8–94.

Proposal 8–2. Several commenters object to proposed § 21.16(a) which would delete reference to a "novel and unusual design feature" as a necessary condition for the Administrator to issue special conditions. Special conditions become a part of the designated applicable regulations for type certification of a particular product (aircraft, craft engine, or propeller).

One commenter indicates that the proposed revision is unjustified and would lead to indiscriminate rule making, and that instead of simplifying the administration of the requirements it would introduce

the same commenter asks several relevant questions. When § 21.21(b)(2) is applied, does the FAA make it retroactive to the other involved models? Are Airworthiness Directives (Part 39) issued? Why wasn't a special condition issued against the first applicant when the condition was, in fact, novel or unusual? Why was this not followed by a notice of proposed rule making for future application?

These comments and questions caused the FAA to completely reevaluate its practices in designating the applicable regulations for type certification under § 21.17(a), commonly referred to as defining a "type certification basis."

After further consideration of the comments received as well as FAA practice in designating the applicable regulations, and the objectives of proposed § 21.16, the FAA agrees that this proposal should be withdrawn because of the potential for possible abuse of general rulemaking procedures, of the requirements of the Administrative Procedure Act, and the intent of Executive Order 12044. As explained below, the objectives of proposed § 21.16 will be satisfied by the application of a new FAA policy affecting the designation of applicable regulations for the type certification of new aircraft, aircraft engines, and propeller designs. These future practices are consistent with the FAA General Rule-Making Procedures of Part 11, the Administrative Procedure Act, and Executive Order 12044.

Section 21.16 is one paragraph of a number of paragraphs used to define the type certification basis of a new product. Companion paragraphs of importance to this discussion include §§ 21.17 and 21.21. Section 21.17(a) provides that the applicable airworthiness standards are (1) those requirements of this subchapter that are effective on the date of application for a type certificate, unless otherwise specified by the Administrator or unless compliance with later effective amendments is elected by the applicant or required by special retroactive regulations (e.g., § 25.2), and (2) any special conditions prescribed by the Administrator in accordance with § 21.16. Section 21.16 provides for the issuance of special conditions when the Administrator finds that the existing airworthiness standards do not contain adequate or appropriate safety standards *because of novel or unusual design features* of the product to be type certificated. Section 21.21(b)(1) permits noncompliance with specific provisions of the airworthiness standards when there are compensating factors that provide an equivalent level of safety. Such determinations are commonly referred to as "equivalent safety findings." Section 21.21(b)(2) provides for the denial of a type certificate, notwithstanding a showing of compliance with the applicable airworthiness standards designated in accordance with § 21.17, if the Administrator finds an unsafe feature or characteristic of the product for the category in which certification is requested.

Sections 21.16, 21.17, and 21.21, taken together with FAA policy in designating the applicable regulations must recognize and balance four important considerations: (1) the FAA has an obligation under Section 601 of the Federal Aviation Act of 1958 to keep the airworthiness standards of this subchapter (i.e., FARs 23, 25, 27, 29, 31, 33, and 35) as current as practicable; (2) the type certificate applicant has a right and a need to know, in very specific terms, what the applicable airworthiness standards will be in order to finalize the detail design of its product and to enable the applicant to make reasonable performance guarantees to its potential customers; (3) in the interests of safety, rapid technological advances presently being made by the civil aircraft industry require that the FAA be able to issue special conditions to address truly novel or unusual design features that it has, as yet, not had an adequate opportunity to envisage in the airworthiness standards through the general rulemaking process; and (4) because the airworthiness standards of this subchapter are intentionally objective in nature to allow flexibility in design, the FAA must retain the prerogatives both to make equivalent safety findings and to deny a type certificate whenever an unsafe design feature or characteristic is found during the type certification process.

The phrase "novel or unusual" as used in § 21.16 is a very relative term. As used hereafter in applying § 21.16 to justify the issuance of special conditions, "novel or unusual" will be taken with respect to the state of technology envisaged by the applicable airworthiness standards of this subchapter. It must be recognized that in some areas which will vary from time to time the state of the regulations may somewhat lag the state of the art in new design because of the rapidity in which the state of

an upgrading of the airworthiness standards of this subchapter is warranted, the upgrading will be promulgated as an amendment to this subchapter consistent with the general rulemaking procedures of FAR Part 11, the Administrative Procedure Act, and Executive Order 12044. Should the FAA conclude that there is a compelling safety need to apply a proposed amendment retroactively to designs already type certificated or to designs for which a type certificate application is in progress, the retroactive aspects of the proposed amendment, if supportable by a regulatory analysis completed in accordance with Executive Order 12044, will be announced in the notice or proposed rule making for that amendment. Public comments on the proposed retroactive aspects will be considered in determining the applicability of the adopted rule.

A number of products for which special conditions have not as yet been issued are undergoing type certification at the time of this amendment. Should the FAA conclude that recent or future amendments to this subchapter should be applied to these products that would not otherwise be applicable under § 21.17(a)(1) then an amendment to require retroactive application will be proposed and acted upon through the general rulemaking process explained above, in lieu of issuing special conditions under § 21.16.

Also, the provisions of § 21.21(b)(2) will no longer be used to justify the issuance of special conditions. However, just as an Airworthiness Directive may be issued under Part 39 to require the correction of an unsafe condition that is likely to exist or develop in a product of the same type design, notwithstanding a showing of compliance with the applicable airworthiness standards, § 21.21(b)(2) may continue to be used to deny issuance of a type certificate if a similar unsafe feature or characteristic is found during the type certification process, notwithstanding a showing of compliance with requirements designated by § 21.17. The unsafe features and characteristics envisaged by § 21.21(b)(2) are those related to specific design configuration or product characteristics of a particular design, that one would not normally expect the applicable airworthiness standards to specifically preclude because of their intentionally objective nature.

It is the practice of the FAA to develop and publish a Type Certificate Data Sheet as an integral part of each type certificate. The type certification basis is recorded on the Type Certificate Data Sheet for public information. In the future the type certification basis statement will identify not only the applicable regulation, including special conditions, but also will identify all exemptions issued pursuant to Part 11, together with "equivalent safety findings" made in accordance with § 21.21(b)(1).

For the above reasons, Proposal 8–2 is withdrawn.

In considering its disposition of the proposal to amend § 21.16(a), the FAA realizes that a "novel or unusual design feature" today may become a common design feature of the future. The issuance of a like special condition for several product designs will most likely compel general rule making on that subject and the history of that special condition could have a very strong influence on thinking when general rule making is initiated. Also, although special conditions are regulations of particular product applicability, they are issued only in the interest of public safety. For these reasons, Part 11, and § 21.16 of Part 21 are amended to require special conditions to be issued in accordance with the existing general rule-making procedures. As is now the case, a docket will continue to be maintained for each set of special conditions, and all material in the docket will continue to be available for public review.

Proposal 8–3. This proposal is one of a group of proposals dealing with the establishment of instructions for Continued Airworthiness and the responsibilities of maintenance personnel and aircraft operators with respect to those instructions. The group is made up of the following proposals: 8–3, 8–5, 8–21, 8–25, 8–58, 8–62, 8–64, 8–67, 8–77, 8–80, 8–89, 8–91, 8–92, 8–93, 8–97, 8–98, 8–99, 8–104, 8–106, 8–107, 8–110, and 8–111.

A commenter representing a number of scheduled air carriers objects to the requirement in § 21.31(c) that the type design include the Airworthiness Limitations section of the Instructions for Continued Airworthiness because of the information to be included in that section. Although this commenter does not object to including mandatory replacement times for life-limited parts in the Airworthiness Limitations section,

inspection programs approved under §§ 121.23(b), 121.45, 121.367, 121.377(e), (f), 135.17, 135.419, 135.421, and 135.425, as defined by approved operations specifications, or an inspection program approved under § 91.217(e) constitute acceptable alternatives. The appendices to Parts 23, 25, 29, 31, 33, and 35 as adopted in this amendment require the applicant to specify (in the Airworthiness Limitations section) mandatory replacement times, inspection intervals, and related procedures. Sections 43.16 and 91.163(c) have been revised to show that only the inspection times and procedures may be adjusted under approved alternative programs.

A commenter objects to § 21.31(c), which in general is applicable to manufacturers, since continued airworthiness, which is covered in the paragraph, is the responsibility of the operator. Because this comment pertains more directly to § 21.50, it is dealt with in conjunction with Proposal 8–5.

In addition to comments relating to the instructions for Continued Airworthiness, a commenter objects to § 21.31(a) because the proposal to include a list of drawings and specifications in the type design was not mentioned at the Airworthiness Review Conference. In fact, this proposal did appear as an FAA comment on Proposal No. 565 in the Committee I Workbook (titled "Procedures and Special Subjects") made available to all participants at the conference, and may be found in the docket.

Several commenters object to § 21.31(d) because including analyses in the type design—(1) would be redundant, since it is already required as part of the substantiating data; (2) is unnecessary, since the drawings and specifications required under current § 21.31(a) provide the general information needed by the FAA; and (3) introduces the possibility that the FAA would require the manufacturer to provide any and all data used to prepare the drawings and specifications, thereby delaying type certification. The FAA agrees that proposed § 21.31(d) would serve no useful purpose and it is withdrawn.

Proposal 8–4. A commenter objects that § 21.35(b)(2) eliminates flight testing for reliability, contending that analysis and ground test are not dependable as a basis for certification. In the light of this comment, and after further consideration and experience, the FAA has determined that flight testing for reliability does provide safety information not necessarily obtainable from analysis and ground test. Accordingly, the proposal to delete the reference to reliability in § 21.35(b)(2) is withdrawn.

No adverse comment was received on the proposal to replace the word "airplanes" in § 21.35(b)(2) with the word "aircraft" and this amendment to § 21.35(b)(2) is adopted without change.

Proposal 8–5. commenter objects to the continued airworthiness provisions of § 21.50(b) (and also proposed § 21.31(c)) contending that—(1) continued airworthiness is the responsibility of the operator/owner; (2) current regulations in Parts 23 and 25 already require manufacturers to make available recommended maintenance procedures for the product at the time of its delivery; (3) current operating rules require the operator/owner to establish and comply with a maintenance program; and (4) with respect to transport airplanes, the present FAA Maintenance Review Board (MRB) system is an entirely satisfactory way of establishing the means for maintaining airworthiness. Current FAA practice allows operators of new transport category airplanes to utilize FAA MRB recommendations (reference FAA Advisory Circular No. AC 121–22) for starting their maintenance programs, and then vary them with FAA approval as experience and operating conditions dictate. The commenter points out that, contrary to that practice, the amendment will require the manufacturer to obtain FAA approval of its recommended maintenance procedures before the airplane is type certificated, and to obtain FAA approval of revisions to those procedures (necessitated by any improvement change in the airplane) before approval of the change itself. This, the commenter states, will impose a severe and unnecessary hardship on the manufacturer.

On the first and second points, although the operator/owner does have responsibility for continued airworthiness, the FAA has found that the recommended maintenance procedures made available under current regulations are frequently inadequate in scope and content, and often do not provide a sound basis for the operator/owner to maintain the airworthiness of the aircraft. The FAA has concluded that the lack of such recommended maintenance procedures can best be remedied by requiring that they be made available to owners and operators by the type certificate or supplemental type certificate holder. On the third point, while it is true that not all operators/owners are required to establish and comply

the operators and manufacturer, could be picked up by the type design holder and included as a part of the required instructions for Continued Airworthiness, thus continuing the usefulness of the existing MRB practices for the original entry into service of new product designs. Likewise, the additional maintenance instructions that would be required and which are not typical to MRB documents, but are presently required in air carrier operators' FAA approved maintenance programs, could also be picked up by the type design holder. Therefore, the screening process that would be utilized by the FAA in reviewing such maintenance documents would not unnecessarily delay type certification or approval of design changes after certification. See also the discussion under Proposal 8–3.

A commenter questions the need for the provision in § 21.50(b) requiring that the Airworthiness Limitations section of the instructions for Continued Airworthiness be furnished with each aircraft, engine, or propeller. The FAA agrees that this provision is unnecessary, as the type certificate holder must make the manual available, and the operator/owner must comply. To require a manual to be furnished with each equipment would be redundant, and in some instances, would be unnecessary. Accordingly, the requirement that the Airworthiness Limitations section be furnished with each airplane or product is revised to require that the section be furnished to each owner of the type.

A commenter objects to § 21.50(b) insofar as it applies to rotorcraft type certificated under Parts 27 and 29, contending that the manufacturer is already required under those parts to furnish a maintenance manual, which has allegedly been proven adequate. The FAA does not agree. The proposed instructions for Continued Airworthiness, which are broader in scope and more detailed than the maintenance manual currently required under Parts 27 and 29, would provide the operator/owner with the minimum amount of information needed to maintain the airworthiness of increasingly complex rotorcraft currently being designed.

A commenter suggests that § 21.50(b) be revised to make it clear that an aircraft manufacturer need not supply instructions for Continued Airworthiness pertaining to engines and propellers until the complete aircraft is delivered to the first retail purchaser. The continued airworthiness instructions for propellers and engines should be provided to the aircraft manufacturer to facilitate transmittal to purchasers of the aircraft.

A commenter notes that § 21.50(b) would require an aircraft manufacturer to make the Instructions for Continued Airworthiness available to the owner upon delivery of the aircraft and to any other person required to comply with any of the terms of those instructions *upon request.* Since such a request could be made before the first aircraft delivery, it could impose an unnecessary burden on the aircraft manufacturer. The commenter suggests that § 21.50(b) be revised so that such a request need not be filled until after delivery of an aircraft to the first owner. The FAA agrees that an early request for the Instructions for Continued Airworthiness could impose an unnecessary burden on the manufacturer. Additionally, the FAA notes that airplanes can be delivered to an operator, prior to full type certification, with a provisional airworthiness certificate to allow activities such as crew training, and therefore prior to the approval of the Airworthiness Limitations section. Accordingly, the phrase ''upon request'' has been deleted from § 21.50(b) and the language has been revised to require that at least one set of the complete instructions for Continued Airworthiness be furnished upon delivery to the customer, or subsequent issuance of the first standard certificate of airworthiness, whichever occurs later.

Proposal 8–6. Commenters object to the proposal to make § 21.97(b) applicable to all products rather than to engines only because1) the volume of paperwork would increase out of proportion to any benefits that might be gained; (2) the applications for supplemental type certificates would be scantly more complex, since there are frequently many configuration variations within an aircraft model and a fleet operator would have to list all of the configurations or make separate application for each; and (3) the term ''specific configuration'' must be defined if the proposal is to be properly administered. In light of these comments and after further consideration, the FAA concludes that this proposal requires additional study and it is withdrawn.

that there must be a corporate connection between the prime manufacturer and his supplier. Accordingly, the lab has been revised to reflect the FAA's intent that the quality control data requirements of § 21.143(a)(2) apply to all ''suppliers'' of each prime manufacturer. For similar reasons and for internal consistency, § 21.143(b) is revised to replace the term ''subsidiary manufacturers'' with the term ''suppliers''.

Proposal 8–9. No unfavorable comment was received on the proposal to amend § 21.182 to ensure that the proposed new § 45.11(c) is cross referenced. Accordingly, the proposal is adopted without substantive change.

Proposal 8–10. A commenter raises the question whether a special flight permit issued under § 21.197(a)(3) would serve as a certificate of airworthiness for international flights. The FAA notes that international flights cannot be conducted under special flight permits under § 21.197 unless specifically authorized by the foreign authorities concerned.

Another commenter objects to § 21.197(a)(3)(ii) because as worded, the individual aircraft would have to be flown for at least 50 hours, thereby defeating the purpose of the original proposal (as submitted for the Airworthiness Review) which aimed at eliminating unnecessary delays in obtaining FAA approval of customer demonstration flights. The commenter suggests that this provision be changed to stipulate that the aircraft type must have been flown for at least 50 hours. The FAA agrees that since the proposal concerns aircraft manufactured under a production certificate, and since the aircraft type could have been flown for at least 50 hours during the type certification program, the 50 hours of flight provision is not necessary. However, the FAA does not agree with the commenter's suggested revision. It is necessary to require that production flight tests for the individual aircraft involved be satisfactorily completed before that aircraft is flown on customer demonstration flights. Accordingly, § 21.197(a)(5) is added to prescribe this condition in place of the 50 hours of flight provision.

The same commenter also suggests that § 21.197(a)(3)(ii) should be made applicable to aircraft produced under a type certificate only, since such aircraft received close production surveillance by the FAA. The FAA agrees that a production certificate should not be the limiting factor in obtaining FAA approval of customer demonstration flights. If the aircraft has been demonstrated to otherwise meet all the safety requirements for a standard airworthiness certificate, then customer demonstration flights could be permitted. This proposal is adopted by the addition of § 21.197(a)(5).

In addition, the commenter suggests that proposed § 21.197(a)(3)(ii) be amended with a reference to the maintenance and inspection programs called for under § 21.195 for Experimental and Subpart C Provisional Type Certificates. Such procedures would unnecessarily complicate the issuance of permits for customer demonstration flights and would in effect nullify the original proposal. The portion of the proposal calling for maintenance and inspection programs in these instances is therefore withdrawn.

Proposal 8–11. No unfavorable comments were received on the proposal to amend 23.253(b)(3) to ensure that high speed buffeting does not become severe enough to prevent the pilot from reading the instruments or controlling the airplane. Accordingly, the proposal is adopted without substantive change. Also see Proposal 28.

Proposal 8–12. No unfavorable comments were received on the proposal to amend § 23.361 to redefine the limit engine torque load conditions to be considered for turbine engine installations and to make other clarifying changes. Accordingly, the proposal is adopted without substantive change.

Proposal 8–13. The FAA does not agree with a commenter who suggests that the lead-in of § 23.371 be revised to make the gyroscopic load requirements applicable to piston as well as turbine engines. The FAA has no information to indicate a need for coverage of ton engines in this regulation, nor was any submitted by the commenter.

Another commenter concurs with § 23.371, assuming that a rational analysis of loads under § 23.371(a) is an alternate to the loads specified in § 23.371(b). This assumption is correct. No change to § 23.371 was proposed in this regard. Section 23.371 is adopted without substantive change.

should inform the pilot that the gear is secured in the extended or retracted position.

A commenter states that the proposal is redundant since the requirement is already in effect. The FAA does not agree. This is one of several new provisions being incorporated into the current regulations to assure the reliability of small land-plane landing gear systems.

After further review, the FAA has determined that the words "and warning device" should be removed from the heading of § 23.729(e) to preclude confusion between the requirements of this paragraph and those of § 23.729(f). Section 23.729 is adopted with editorial changes and the revisions discussed.

Proposal 8–15. A commenter objects to § 23.903(f) on the grounds that it imposes new and unjustified criteria for restart capability of reciprocating engine powered airplanes. FAA believes the requirement to be fully justified. Accidents have occurred with multiengine reciprocating powered, as well as turbine powered airplanes because pilots have not been adequately apprised of the engine restart envelope for their airplane. Therefore, the requirement must apply to both types of engine installations.

This commenter further states that § 23.903(g) is acceptable provided that the "restart requirement is understood to be within the restart envelope for the aircraft (if one is approved for the aircraft)." Present § 23.903(e)(3), as applicable to turbine engine powered small airplanes, state9 that it must be possible to restart an engine in flight, and § 23.903(f) requires that an approved restart envelope be established. Therefore, development of a restart envelope would be required for the approval of each turbine engine powered small airplane. As adopted, § 23.903(g) requires that, following in-flight shutdown of all engines, electrical power for ignition exists throughout the approved restart envelope.

Another commenter states that it seems inconsistent to require that electrical power be provided for ignition but not for rotational capability sufficient for an engine start. The FAA does not agree. As adopted, the rule provides for those circumstances where engine windmilling speed is sufficient for restarting but insufficient to provide electrical power for ignition.

The proposal is adopted without substantive change. However, § 23.903(f) is revised to make it clear that the specified in-flight engine restart capability is required throughout the required altitude and airspeed envelope.

Proposal 8–16. No unfavorable comment was received on adding a new § 23.905(d) referencing propeller blade pitch control system durability requirements. Accordingly, § 23.905(d) is adopted without substantive change. For discussion of a related proposal to add a new § 35.42, see the discussion under Proposal 8–103.

Proposal 8–17. A commenter suggests that since the requirement for fuel tanks to retain fuel during a landing with landing gear retracted or collapsed may be subject to individual interpretation, advisory material on compliance methods should be reviewed with industry prior to implementation of the rule. The FAA does not agree. The revision merely clarifies an existing requirement.a Section 23.967 is adopted without substantive change.

Proposal 8–18. A commenter recommends that the proposal to add a new § 23.991(d) which requires that operation of any fuel pump does not adversely affect continuous engine operation, be withdrawn or its adoption delayed while the compatibility of engine and airplane fuel systems is studied. The compatibility between these systems must be established in the design process, and the relevant design considerations are well known. Delaying the requirement in favor of additional study is not warranted.

Another commenter contends that the requirement is beyond the needs of safety. The FAA agrees that the proposed requirement is too restrictive and § 23.991(d) is revised to provide that the operation of any fuel pump may not affect engine operation so as to create a hazard.

Two commenters disagree with adding a new § 23.991(d), contending that it eliminates present fuel system designs. The FAA has nob information to suggest that compliance with the revised section, as

8–54.

Proposal 8–21. Since the proposal for § 23.1529 is substantively identical to those for §§ 25.1529 (Proposal 8–58), 27.1529 (Proposal 8–64), and 29.1529 (Proposal 8–77), all comments on these proposals are considered here.

A commenter notes that although the explanation for § 23.1529 makes it clear that the Instructions for Continued Airworthiness need not be finalized until delivery of the first airplane, the proposal itself seems to require that they be finalized before type certification. The commenter suggests that this point be clarified. The FAA agrees, and §§ 23.1529, 25.1529, 27.1529, 29.1529, 31.82, 33.4, and 35.4, are revised accordingly.

In response to a commenter representing a group of scheduled air carriers, the FAA notes that, except for the Airworthiness Limitations section, there is no requirement that any operator/owner use the instructions for Continued Airworthiness referred to in §§ 23.1529, 25.1529, 27.1529 and 29.1529. Moreover, the new §§ 43.13(a), 43.16, and 91.163(c) allow the use of other methods. In particular, the use of maintenance manuals and continuous airworthiness maintenance programs developed under current Parts 121, 123, 127, and 135, or an inspection program approved under current § 91.217(e), would be acceptable alternatives to the Airworthiness Limitations section. This commenter suggests that language be added to § 25.1529 to make it clear that alternatives to the instructions for Continued Airworthiness (except the Airworthiness Limitations section) may be used. This suggestion was not adopted because §§ 43.16 and 91.163(c) make this provision sufficiently clear.

Proposals 8–22, 8–23, and 8–24. Final action on Proposals 8–22,8–23, and 8–24 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8–25. The proposals to add an appendix to Parts 23, 25, 27, and 29 (Proposals 8–62, 8–67, and 8–80) setting forth instructions for Continued Airworthiness are substantively identical and are discussed below. Unless otherwise stated, the discussion refers to the designated sections in each of the appendices mentioned above.

§ XX.1(a). A commenter objects to the concept of specifying requirements (as opposed to providing guidance) for the preparation of instructions for Continued Airworthiness, contending that such requirements would lead to time-consuming negotiations between the manufacturer and the FAA, and that some flexibility in providing the instructions is necessary. The appendix sets forth, in broad objective terms, the *kinds* of information the Instructions for Continued Airworthiness must contain. Within this framework, the manufacturer would be free to develop detailed instructions appropriate to its aircraft. The FAA is confident that the appendix provides a reasonable measure of flexibility, and anticipates no difficulties or delays in determining the acceptability of the instructions developed by the manufacturer.

§ XX.1(b). A commenter objects to the requirement that instructions for Continued Airworthiness be provided for appliances, contending that—(1) this information is often not available from the appliance manufacturer; (2) even when available, the information sometimes has to be revised for the particular application in a manner not approved or intended by the appliance manufacturer and (3) the information necessary for customized equipment installations would be unreasonably costly to develop. The FAA does not agree. Such information, which is essential to the continued airworthiness of the aircraft, should be provided for each required product. Accordingly, the language of § XX.1(b) is revised to make it clear that if the aircraft manufacturer does not supply continued airworthiness instructions for the product, the Instructions for Continued Airworthiness for the aircraft must include this information. See also the discussion under § XX.3(a)(5)(i).

A commenter objects to the proposal to include information on engines and all appliances in the instructions for Continued Airworthiness, contending that—(1) such information should be furnished by the engine or appliance manufacturer; and (2) with respect to appliances, only those for which standards have been established by FAA should be covered. On the first point, manufacturers of new engine designs are required to supply the information for their products under new § 33.4. Manufacturers of

form, such as on microfilm or microfiche. The language in § XX.2 is sufficiently broad to cover these acceptable alternatives. Reference to the Air Transportation Association of America Specification No. 100 (where it appeared) is deleted from § XX.2(b) because it is nonregulatory.

§ XX.3, lead-in paragraph. A commenter objects to the requirement that the contents of the manual "be prepared to be understood by the persons who will be responsible for maintaining" the aircraft or product, contending that—(1) it would impose a subjective standard that would be impossible to meet; and (2) it could be interpreted to mean that, in some circumstances, manuals for aircraft to be exported must be prepared in the language of the country of export. In light of these comments, the first sentence of the lead-in paragraph of § XX.3, is revised to read as follows: "The contents of the manual or manuals must be prepared in the English language." This conveys the intent of the original proposal. A commenter points out that there may be different levels of maintenance instructions, directed at different classes of operators. For example, the maintenance instructions provided to a fleet operator or commuter airline may be more comprehensive than those provided to a fixed base operator. Any level of maintenance instructions considered appropriate by the manufacturer may be submitted, provided that those instructions comply with the minimum standards in the appendix.

§ XX.3(a)(2). A commenter recommends that the cement for complete descriptions be limited in scope to the "standard" aircraft and quantity-installed" optional equipment, contending that it would be virtually impossible to devise "custom" maintenance manuals for each product because of the many combinations of equipment that may be ordered by the purchaser. In addition, the commenter states that a manual containing all of these combinations would be difficult to use. The FAA does not agree. To achieve its purpose, the instruction5 for Continued Airworthiness must contain information on each item of equipment required by regulation to be installed on the aircraft. The FAA notes that supplemental type certificates (STC's) are required for installation of equipment not a part of the type certificate, and that this maintenance manual requirement is equally applicable to the STC applicant.

§ XX.3(a)(3). A commenter recommends that since maintenance personnel have no need for the kind of operating information provided in a Pilot's Operating Handbook, the paragraph be revised to require only principles of equipment control and operation. The FAA agrees, and § XX.3(a)(3) now refers to "basic control and operation information."

§ XX.3(a)(5). A commenter recommends that applicants be allowed to refer to a component manufacturer as a source of information instead of including the information in the instructions for Continued Airworthiness. The commenter argues that many component manufacturers prefer to maintain control of their maintenance information to ensure that it is up to date. In other cases, maintenance at the factory may be required because of the complexity of the equipment. The FAA recognizes that some accessories, instruments, and equipment have an exceptionally high degree of complexity, requiring specialized maintenance techniques, test equipment, or expertise. In such cases, it would be in the interest of safety to allow the applicant to refer to the appropriate manufacturer in the maintenance instructions. The FAA does not agree, however, that such reference should be allowed in other circumstances. Section XX.3(a)(5)(i) (redesignated § XX.3(b)(1)) is revised accordingly.

A commenter recommends that the last sentence of § XX.3(a)(5)(i), be revised to allow reference to a separate inspection program, rather than include it in the maintenance instructions, so that the inspection program could be better kept current and also tailored to an individual operator's needs. The FAA does not agree. The inspection program must be set forth in the instructions for Continued Airworthiness to ensure its availability to those who will benefit from it.

The FAA, after further study of § XX.3(a)(5)(i), has decided that the provision should specifically require a description of applicable maintenance or wear tolerances. Section XX.3(a)(5)(i) (redesignated § XX.3(b)(1)) is clarified in this regard.

§ XX.3(a)(5)(ii). A commenter objects to the words "could occur" in this paragraph because it encompasses everything within the realm of possibility, thereby unnecessarily increasing the volume of the

which would necessitate a check to determine aircraft damage, to single out one occurrence would imply that the others need not be covered in the maintenance instructions. Accordingly, the words ''checks after an overweight landing'' are deleted from § XX.3(a)(5)(iv) (redesignated § XX.3(b)(4)).

§ XX.3(b). A commenter recommends deletion of the requirement for an overhaul manual or section, contending that—(1) there are many products that, for safety reasons, should not to be overhauled; and (2) the manufacturer must make the technical assessment as to whether a product can be safely overhauled. In the light of these comments, and after further consideration, the FAA finds that those portions of § XX.3(b) that provide for overhaul information only (except for engines), should not be required in the instructions for Continued Airworthiness. Accordingly, §§ XX.3(b)(1)(i), XX.3(b)(1)(ii), XX.3(b)(1)(iv), XX.3(b)(1)(viii), and XX.3(b)(3), are withdrawn. The other provisions of § XX.3(b) specify information that is needed for purposes other than overhaul.

§ XX.3(b)(1)(iii). No adverse comment was received on this proposal to require structural access plate information. Accordingly, it is adopted as proposed. but redesignated § XX.3(c)

§ XX.3(b)(1)(v). No adverse comment was received on this proposal to require instructions on special inspection techniques. Accordingly, it is adopted as proposed. but redesignated § XX.3(d).

§ XX.3(b)(1)(vi). A commenter points out that no part can be restored to its original condition by protective coatings or treatments. The FAA agrees, and § XX.3(b)(1)(vi) (redesignated § XX.3(e)) is revised to make this clear and to require only the information necessary to apply protective treatments to the structure after inspection.

§ XX.3(b)(1)(vii). No adverse comment was received on this proposal to require data on structural fasteners. According, it is adopted as proposed. but redesignated § XX.3(f).

§ XX.3(b)(1)(ix). No adverse comment was received on the proposal to require a list of special tools. Accordingly, it is adopted as proposed. but redesignated § XX..3(g).

§ XX.3(c). Three commenters object to the concept of supplying generalized repair data. One contended that—(l) the nature of the damage may not be known in a particular case, though it may appear to fall under a general repair ''fix''; (2) the safety of the product may be seriously impaired by repairs made in such instances; and (3) the manufacturer can provide alternate means for a mechanic to obtain repair data. In the light of these comments, the FAA agrees that it is not necessary to include the repair information in the instructions for Continued Airworthiness as proposed. Accordingly, proposed § XX.3(c) is withdrawn.

§ XX.4. A commenter suggests that the manufacturer should be allowed to list items in the Airworthiness Limitations section that it deems necessary to maintain structural integrity. where such items are not called out in the applicable airworthiness standards. Another commenter, representing the scheduled airlines, objects to the inclusion, in the Airworthiness Limitations section, of mandatory replacement times for parts other than limited parts and of mandatory inspection intervals. The resolution of these comments is discussed under Proposal 3. The language proposed for the Airworthiness Limitations sections of the appendices to Parts 23, 26, 27, and 29 is being retained, except that the mandatory replacement times, mandatory inspection intervals, and related procedures are specified as those associated with structural integrity—including those approved under current § XX.571. It also is made clear that FAA approved alternative programs may be used. To avoid unnecessary restriction being placed on operation, only these items are listed in the pertinent Airworthiness Limitations section. Other items can of course be listed in other sections of the instructions for Continued Airworthiness.

Proposal 8–26. The addition of new §§ 25.101(i) and (j) would set forth requirements for automatic systems that affect performance. Including automatic takeoff thrust control systems (ATTCS). In view of the evolving technology of automatic systems, the special features and functions of each design, and the complex relationships with other systems, the FAA has concluded that specific regulations are premature and that safety considerations can be more advantageously addressed in special conditions for specific

throttle setting be included, or are opposed to the proposal completely on the grounds that safety will be compromised in service. Since the rule will apply in the context of a determination of performance rather than an operating requirement. the proposal is adopted without change.

Proposal 8–28. A commenter suggests that the term "impair" in § 25.253(a)(2)(iii) be changed to "significantly impair". The FAA does not agree. In present high altitude, high Mach number jet airplanes. any recovery from upset or speed anomaly must be done essentially by reference to flight instruments. Therefore, any buffet or vibration condition which would in any way impair the pilot's ability to accurately interpret instrument information cannot be tolerated. The same commenter stated that some interpretative material on vibrational frequencies and levels of acceleration would be useful. Use of interpretative material would divert attention from the primary consideration, impairment of pilot ability, which is qualitative. Proposed § 25.253(a)(2)(iii) is adopted without substantive change.

Proposal 7–17. Although no unfavorable comment was received on the proposal to amend § 25.305(d). two commenters state that their agreement was with the understanding that both the discrete gust and the continuous turbulence analyses are required. Present § 25.341(a) requires that limit load factors be established by reference to a discrete gust encounter. Present § 25.305(d) specifies that the dynamic response of the airplane to vertical and lateral continuous turbulence must be taken into account. Both analyses are required.

Two commenters recommend that present § 25.341 be amended to require dynamic loads analysis by reference to discrete gusts having varying gust gradient distances. The FAA does not agree. The combination of discrete gust analysis under § 26.941 and continuous turbulence analysis under § 26.305 is less complex than the method described by these commenters and provides sufficient substantiation of strength. The proposal is adopted without substantive changes.

Proposal 8–29. Many negative comments were received on the proposal to revise § 25.307(a) to require ultimate load tests for each normal and fail-safe critical load condition. Three commenters indicate that the proposed regulation would add to the cost and time required for certification although present airplane safety records do not support the need for a change. One commenter points out that the design philosophy used for commercial transports, due to the dominant influence of the economic requirement for long life without structural fatigue problems, often produces reserve margins of safety. Another commenter proposes that ultimate load tests be limited to structures such as composites. which substantially differ from conventional structure. The FAA agrees that to conduct ultimate load tests for all critical load conditions would greatly increase the amount of testing required, which is not warranted by the safety record since there have been no service features which indicate that present methods of substantiation are inadequate. In many cases failures in service result from conditions such as fatigue or corrosion which are not covered by ultimate load tests. The proposal to require ultimate testing of all structural components therefore is deleted. In some cases, however, analysis must be supplemented by limit and/or ultimate load tests. The amendment, as adopted, is revised accordingly.

Proposal 8–30. Several negative comments were received on §§ 25.365(e) and (f), requiring airplane designers to consider pressure vessel decompression resulting from the loss of any nonplug door, detonation of a bomb within the cabin at all probable locations, and engine disintegration. Several commenters oppose designing for the loss of a nonplug door, stating that there is no reason why nonplug doors cannot be designed to be as safe as plug doors. These commenters suggest that the door design criteria be upgraded to improve door integrity. The FAA agrees that door integrity should be improved to the extent that design for their loss is not justified. Therefore § 25.7S3 is revised in response to Proposal 35 to require this improved level and § 25.365(e)(1) is withdrawn.

Many commenters object to designing for all possible bomb detonations and probable bomb locations. A commenter points out that airworthiness requirements in the past have attempted to safeguard aircraft against structural and mechanical failure, human error, natural hazards, etc. They note that no one has attempted to incorporate into airworthiness requirements the consequences of homicidal or suicidal tendencies. Another commenter states that the aircraft industry has to accept responsibility for compensating

Directive 75-15-05 (August 11, 1975) pertaining to openings [illegible] is revised to allow the maximum opening to vary as a function of the cross-sectional area of the pressurized shell to account for the differences in size between narrow and wide-body transports and is redesignated and adopted as § 25.365(e)(2).

The FAA finds that the maximum opening specified in adopted § 25.365(e)(2) will exceed the opening that would result from causes other than bomb explosions or engine disintegration, and that a probability safety analysis to determine hole size in passenger or cargo areas resulting from other causes is not needed. Thus, proposed § 25.365(f) is withdrawn.

In light of the comments received on proposed § 25.365(e)(4), and after further consideration, the FAA concludes that openings caused by airplane or equipment failure can occur in any compartment, and that partitions, bulkheads, and floors should be designed for openings from these causes. Thus, proposed § 25.365(e)(4) is revised accordingly, redesignated, and adopted as § 25.365(e)(3).

No adverse comments were received on proposed § 25.365(e)(2) to require design to withstand penetration of the cabin by a portion of an engine following engine disintegration and the proposal is redesignated § 25.365(e)(1) and adopted without substantive change.

Amendment to § 25.571(a)(3). Because of the change to § 25.1529 adopted in this amendment, the reference to the "maintenance manual" in § 25.571(a)(3) is no longer appropriate. For consistency. § 25.571(a)(3) references the Airworthiness Limitations section of the Instructions for Continued Airworthiness.

Proposal 8–31. Numerous unfavorable comments were received on the proposal to add a new § 25.633 requiring that essential systems be designed to minimize damage caused by detonation of a bomb in the airplane. Most commenters contend that there is no means to protect essential systems from all possible bomb detonations and that bomb size and location cannot be rationally defined. Several commenters indicate that the separation of essential systems on modern airplanes presently provides a measure of protection and that the proposed requirements of § 25.633 are beyond the state of the art.

The FAA agrees that a rational means of determining and defining all possible bomb size/location combinations which would damage essential systems does not exist. Therefore, the proposal is withdrawn.

Proposal 8–32. Several commenters object to the proposed horizontal stabilizer "trim-in-motion" aural warning requirement of § 25.677(e) on the grounds that the aural environment in today's cockpits is already cluttered and that finding new and distinctive aural warnings is becoming difficult. They further suggest that small increments of trim change should not cause aural warning, and that warnings should be given only when a safety-of-flight hazard exists. One commenter suggests that there is no need for separate aural warning on aircraft having direct trim control wheels in the cockpit.

The FAA agrees with the comments and upon further review concludes that the proposal is premature and unworkable. Accordingly, it is withdrawn for further study.

Proposal 8–33. Several adverse and supporting comments were received on the proposal to add a new § 25.685(e) requiring arrangement of control systems to provide an airplane with the capability of continued safe flight and landing in the event of an inflight localized structural failure. Several commenters agree with the intent of the proposal and propose minor changes. One commenter agrees with the intent of the proposal, but believes that only failures which have not been shown to be extremely improbable need be considered. Commenters state that the intent of the proposed rule change is already encompassed by § 25.365(e) which would require that floor failure resulting from rapid decompression be shown to be extremely improbable.

A commenter further states that present § 25.671(c) requires control systems to be designed to be tolerant of failures, and that control system damage is more likely from other sources. The commenter claims that service experience and rational analysis show that the floor structure provides the best available protection for the control system from damage from these other sources.

that affect airplane performance, one of which is the proposal to add a new § 25.705, see Proposal 8–26.

Proposal 8–35 and 2–59. Several commenters object to the requirement in § 25.783(e) that provisions for the inspection of door locking mechanisms must be discernable under all possible lighting conditions. The commenters state that allowance should be made for use of supplemental lighting such as a flashlight to aid in the inspection. The FAA agrees and the section is revised accordingly.

A commenter states that direct visual inspection is only needed for external doors for which the initial opening movement is not inward and which are pressurized or for which an inadvertent opening could prevent continued safe flight and landing. Although these comments have merit, they go beyond the scope of Proposal 35 and interested parties have not had an opportunity to comment on these changes. No change to the section is being made based on these comments. Several commenters object to the redundancy of a dual warning system requirement and state that in lieu of redundancy, a reliability level should be specified. Further comments state that all external doors do not require this level of reliability. The FAA agrees that this reliability level could be specified and should apply only to external doors for which initial movement is not inward, and the section is changed accordingly. The present language defining where door warning systems are required is retained, as no change in present practice is intended.

A commenter suggests that § 25.783(e) should specify several good design practices. These design practices are desirable but are not essential, since the necessary level of safety can be obtained by alternate means under § 25.783.

Several commenters object to new § 25.783(f), suggesting that it apply only to nonplug type doors and doors whose loss would present a probable hazard. The FAA agrees that provisions to prevent unsafe pressurization can be limited to doors whose loss would present a probable hazard. However, the FAA does not agree that it should be limited to nonplug type doors because a plug door is defined as one whose initial opening is inward and this feature does not necessarily provide complete assurance that an unsafe pressurization will not occur with subsequent opening of the door in flight. The clarifying phrase "to an unsafe level" has been added to § 25.783(f). The intent is to prevent pressurization to a level which would be hazardous if an unlocked external door inadvertently opened.

Several commenters object to proposed new § 25.789(g) (Proposal 8–35), stating that it would unnecessarily preclude the use of nonplug type doors above 45,000 ft. The FAA agrees that nonplug type doors can safely be used at altitudes above 45,000 ft., since adequate warning systems and door integrity are provided by § 25.789(e). Proposed new § 25.783(g) is withdrawn.

A commenter proposes that for the door whose opening would be a hazard, the door and immediate surrounding fuselage, door mechanisms, and warning system be designed for any combination of failures (including improper operation) not shown to be extremely improbable. The FAA agrees. In place of the proposals in 8–30, with regard to §§ 25.365(e) (1), (3), and (4), a rule is included to require determination by safety analysis that inadvertent opening of doors which could prevent continued safe flight and landing is extremely improbable.

Two commenters state that the criteria for passenger egress in the revision to the second sentence of § 25.783(g) (Proposal 2–59 of Notice 75–10) should be evacuation time, and not the rate of passenger egress through a given exit. The FAA agrees. Revision of the second sentence of § 25.783(g) is redesignated as § 25.783(i) and the reference to § 25.561(a)(3) in the proposal is corrected to reference § 25.561(b)(3).

Numerous negative comments concern proposed new § 25.783(j), which requires that lavatory doors open into the cabin to preclude anyone from being trapped in the lavatory. The commenters state that this requirement is overly restrictive on design and that an outward opening door could have an adverse effect on aisle width and emergency evacuation capabilities if such a door jammed open. The FAA agrees that inward opening doors can be designed to prevent anyone being trapped in a lavatory in

prevented people from "standing in line" for lavatories. Also, passengers can cause congestion in aisles for other reasons. One of the commenters states that lighted signs in a darkened cabin; i.e., during movies or rest periods, would annoy passengers, and that the rule might foster a proliferation of signs throughout the cabin. Finally, one commenter is concerned that any increase in the number of lighted signs might distract the passengers' attention from more essential notices.

Based on the comments and upon further review, the FAA finds that the proposed requirement would not achieve the objective sought. Accordingly, the proposal is withdrawn.

Proposal 8–39. Final action on Proposal 8–39 was taken in Airworthiness Review Program Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8–40. Final action on Proposal 8–40 was taken in Operations Review Program Amendment No. 8 (45 FR 41586, June 19, 1980).

Proposal 8–41. A commenter suggests that new § 25.851(a)(5), which replaces current § 25.853(f), be expanded to prescribe four fire extinguishers for a passenger capacity of 100 or more, and to require at least one CO_2, dry chemical, or all purpose fire extinguisher near lavatory and galley areas. These suggested changes are beyond the scope of the notice. However, changes in these requirements are appropriate and the FAA is conducting a research program to establish comprehensive standards and guidance information pertaining to the selection of portable fire extinguishers, taking into consideration types and quantities of extinguisher agents, extinguisher performance, and other factors. Regulatory changes based on the findings of this research program will be proposed in the next airworthiness standards review.

Sections 25.851(a)(5) and (a)(6), which consolidate hand fire extinguisher requirements, are adopted without substantive change.

Proposals 8–42, 2–18, 2–65, 2–114, and 2–160. Final action on Proposals 8–42, 2–18, 2–65, 2–114, and 2–160 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8–43. Final action on Proposal 8–43 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8–44. For a discussion of proposed § 25.905(c), see the discussion under Proposal 8–103. The proposal to add a new § 25.905(c) is adopted without substantive change.

Proposals 8–45 and 8–96. The proposed amendments to §§ 25.939 and 33.65 are being deferred for consideration in a forthcoming notice of proposed rule making of the Aircraft Engine Regulatory Review Program.

Proposals 8–46, 3–35, and 8–47. Final action on Proposals 8–46, 3–35, and 8–47 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8–48. For an explanation of the withdrawal of the proposals concerning automatic takeoff thrust control systems, one of which is the proposal to add a new § 25.1143(f), see Proposal 8–26.

Proposals 8–49 and 3–41. Final action on Proposals 8–49 and 3–41 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8–50. For an explanation of withdrawal of the proposals concerning automatic takeoff thrust control systems, one of which is the addition of a new § 25.1305(c)(9), see Proposal 8–26.

One commenter objects to revising § 25.1305(d)(1), stating that scant aerodynamic forces acting on the powerplant nacelle make the direct measurement of thrust impractical. The FAA agrees that such forces may be significant. This commenter further objects to the revision, stating that it is beyond the state of the art to prohibit a parameter from being used if the accuracy of the indication will be adversely affected by any engine malfunction or damage. The FAA agrees that precise values of thrust provided

This commenter also states that § 25.1305(d)(1) should be complementary to a similar requirement in Part 33 of this chapter. The FAA does not agree. In current practice, the airframe manufacturer determines how performance should be met. The choice of a means to indicate thrust is negotiated between the airplane manufacturer and the engine manufacturer. The factors which influence the final choice are substantial and may vary among airplane designs. These factors may not he known to the engine manufacturer at the time of engine type certification. Another commenter states that the need for an actual value of thrust is not obvious, whereas indication of a loss of thrust would satisfy the original proposal. The FAA agrees that the actual value of thrust is of little value to the pilot. Section 25.1305(d)(1) is revised to specify that the indicator indicate thrust, or a parameter related to thrust, to the pilot.

Proposal 8–51. No unfavorable comments were received on the proposal to change the reference in § 25.1307(h) for fire extinguishers in connection with Proposal 8–41. Accordingly, the proposal is adopted without substantive change.

Proposal 8–52. Final action on Proposal 8–52 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8–53. Several commenters point out a number of service deficiencies with proposed § 25.1421 which defines the requirements for cargo compartment fire detection systems. They contend that the requirement for the detection system to actuate a warning within one minute of the start of a fire is too restrictive. One commenter cites the results of FAA tests which show average fire detection times to be from 1.75 to 5 minutes. The commenters also suggest that the tests necessary to show compliance with the warning requirements are not clearly defined. Finally, one commenter points out that fires in baggage containers and other enclosed containers can burn for a considerable time before detection is likely by fire detectors in the cargo compartment.

The FAA does not concur that the one-minute requirement is too restrictive. A survey of fire detection technology has indicated that the state of the art permits detection of a fire in less than one minute after inception. In addition, current standards do not define the test procedures necessary to show compliance with warning requirements. The new one-minute requirement is intended to improve the standards in this regard.

The proposal is adopted without substantive change.

NOTE: This proposal has been carried erroneously under § 25.1421 which pertains to megaphones. It will be included in the amendment as a new § 25.858.

Proposal 8–54. Comments received from several commenters reflected confusion over the intent of proposed § 25.1439(c). It was noted that much of what was intended by proposed § 25.1439(c) is included in existing § 25.1439(a) as amended by Amendment 25–38 (41 FR 55454; 12/20/76), provided that the portable oxygen requirements of § 25.1447(c)(4) are retained. Amendment 25–38 emanated from Airworthiness Review Program Notice No. 2 (40 FR 10813; 3/7/75), and was adopted (41 FR 55468; 12/20/76) after publication of Airworthiness Review Program Notice No. 8 (40 FR 29420; 7/11/75) which contained proposals 8–54 and 8–55. The FAA agrees that the existing regulations require much of what was intended by proposal 8–54, provided that proposal 8–55 is withdrawn. The FAA further agrees that additional clarifications are needed before further amendments are made to § 25.1439. Therefore the FAA withdraws both proposals 8–54 and 8–55. The subject of protective breathing equipment will be addressed in a forthcoming notice of proposed rule making.

Proposal 8–55. The proposal to delete § 25.1447(c)(4) is withdrawn for the reasons stated for withdrawal of Proposal 8–54.

Proposal 8–56. For comments related to the proposal to revise § 25.1521(a), and for the withdrawal of that proposal, see Proposal 8–94.

is unnecessary to achieve this result and the proposal is withdrawn.

Proposals 8–60 and 8–61. Final action on Proposals 8–60 and 8–61 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 7–55. A commenter recommends that discrete gusts with varying gradient distances be added as a supplement to Appendix G to Part 25. The FAA disagrees because past experience with the use of discrete gusts with varying gust gradient distances has indicated that knowledge with regard to how gust intensity varies with gust gradient distance is not currently available to the designer. The research and development work accomplished in the area of dynamic response to continuous turbulence has indicated that the continuous turbulence criteria of Appendix G to Part 25 is the most rational approach currently available which gives consistent strength levels for airplanes of different characteristics and missions.

A commenter recommends that paragraph (a) of Appendix G be revised to delete the requirement for considering combined stresses based on both vertical and lateral components of turbulence. The commenter states that the current practice of combining root-mean-square stresses (shear, moment, and torsion) resulting from gust calculations involving only purely vertical or lateral components of turbulence is a realistic, practical method for combining stress. The commenter contends that the methods for realistically combining statistical load quantities involving both vertical and lateral components of turbulence have not been satisfactorily developed in the current state of the art. After further review the FAA agrees. Paragraph (a) of Appendix G is revised to delete the requirement for considering the combined stresses resulting from the vertical and lateral components of turbulence.

A commenter recommends that paragraph (b)(3)(i) of Appendix G be revised to require a gust intensity of $U\sigma$=75 fps gust velocity in the interval 0 to 20,000 ft. altitude with a linear decrease to 30 fps at 80,000 ft. altitude. This recommendation would obviate the need to do mission analysis to justify lower levels of loads than those required to meet the design envelope gust intensity factor of 85 fps for new airplanes whose characteristics are similar to previous designs which have been shown to he adequate for the lower level of gust intensity being proposed. There is no technical need for new aircraft which are similar to existing aircraft with regard to response characteristics and basic mission profiles to make extensive mission analysis computations in order to establish their adequacy with regard to loads resulting from encounters with continuous turbulence if they are designed for the gust intensity shown to he adequate for the existing design. Therefore, it is acceptable to use a gust intensity value of 76 fps from 0 to 20,000 ft. altitude, and a linear reduction from 75 fps at 20,000 ft. to 30 fps at 80,000 ft., provided the new design is comparable to a similar design with extensive satisfactory service experience. These criteria, which have been under discussion between FAA and industry for over 10 years, are proposed as new rules rather than acceptable means of complying with existing rules. Paragraph (b)(3)(i) is revised accordingly. The commenter also recommends that paragraph (d)(1) be revised to require a gust intensity of $U\sigma$=60 fps on the interval 0 to 20,000 ft. altitude and be linearly decreased to 23 fps at 80,000 ft. altitude. The FAA disagrees. The gust intensities in paragraph (d)(1) are based on the distribution of gust intensity with altitude which were developed in the basic research for the development of continuous turbulence criteria and are, therefore, considered reasonable as a lower design envelope limit for mission analysis. A cost analysis was provided by the commenter to justify the lower gust intensities, but the FAA finds that this cost analysis was based on ''design envelope analysis'' alone. Paragraph (c), which is an alternative to paragraph (b), provides for a ''mission analysis''. Actual experience has shown that ''mission analysis,'' which considers airplane operational characteristics, has been used in the past in lieu of the 85 fps intensities to prevent weight and cost penalties. Paragraphs (c) and (d) of Appendix G are adopted without substantive change.

A commenter recommends that paragraph (d) of Appendix G be revised to delete the reference to ''fail-safe loads'' since such loads are not provided in Appendix G. The FAA agrees. Paragraph (d) of Appendix G is revised accordingly.

in Proposal 8–25.

Proposal 8–63. Final action on Proposal 8–63 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Amendment to § 27.571. Because of the change to § 25.1529 adopted in this amendment, the reference to § 27.1529(a)(2) in §§ 27.571(b), (c), (d)(1), (d)(3), and (e) is no longer appropriate. The reference is changed to "§ A27.4 of Appendix A". This discrepancy was overlooked in Notice 75–31 (40 FR 29410; July 11, 1975). Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 8–64. For comments related to the proposal to amend § 27.1529, see Proposal 8–121.

Proposals 8–65 and 8–66. Final action on Proposals 8–65 and 8–66 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8–67. For comments related to the proposal to add a new Appendix A to Part 27, see Proposal 8–25. Additional comments on this proposal, and on the proposal to add a new Appendix A to Part 29, are discussed here.

A commenter suggests that the wording of Appendix A be adjusted to take into account the differences between airplanes and rotorcraft. The FAA agrees. The appendix, as proposed, is generally equally applicable to airplanes and rotorcraft. However, several minor changes have been made to the appendix to provide for rotorcraft differences, primarily to cover rotors and differing fatigue standards.

A commenter objects to Appendix A, contending that: (1) The standards in current §§ 27.1529 and 29.1529 have been adequate in service, and (2) the proposal is excessive in scope and would create an undue burden. The FAA does not agree, having found that recommended maintenance procedures made available to operators/owners in the past were frequently inadequate in scope and content, providing no sound basis for maintaining the airworthiness of the rotorcraft. Appendix A, with the revisions and deletions discussed above and under Proposal 8–25, would not create an undue burden on the type certificate applicant.

One commenter expresses concern that certain inspection provisions in current § 91.217 might be applied to rotorcraft. The appendix contains no such requirement. Current § 91.217 applies only to certain airplanes.

Amendment to § 29.571. Because of the change to § 29.1529 adopted in this amendment, the reference to "§ 29.1529(a)(2)" in §§ 29.571(b), (c), (d)(1), (d)(3), and (e) is no longer appropriate. For consistency, the reference is changed to "§ A29.4 of Appendix A required by § 29.1529". This change was overlooked in Notice 75–31 (40 FR 29410; July 11, 1975). Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 2–154. For a discussion directly related to proposed new § 29.783(g), see the discussion under Proposal 8–35 for § 25.783(g) (Proposal 2–59 of Notice 75–10). Section 29.783(g) is adopted without substantive change.

Proposals 8–68 through 8–76 and 2–164. Final action on Proposals 8–68, 8–69, 8–70, 8–71, 8–72, 8–73, 8–74, 8–75, 8–76, and 2–164 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8–77. For comments related to the proposal to amend § 29.1529, see Proposal 8–21.

Proposals 8–78 and 8–79. Final action on Proposals 8–78 and 8–79 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

performance in terms of an initial minimum rate of climb. However, a commenter raises the question whether compliance with proposed § 31.17(a) could be shown by testing at several altitudes and ambient temperatures and then extrapolating, by appropriate analysis, to the other values in the range for which approval is sought. The FAA considers that such extrapolation by analysis is an acceptable means of complying with proposed § 31.17(a), because the climb performance of balloons is based on fundamental principles and, therefore, can be predicted with sufficient accuracy from established test points.

The FAA notes that the 300 fpm climb rate requirement in § 31.17(a) was intended as a minimum standard. To make this clear, § 31.17 as adopted is revised by inserting the words "at least" before the number "300" in the first sentence of § 31.17(a).

Proposal 8–84. A commenter, referring to new § 31.19(a) governing critical uncontrolled descent, suggests that it would be difficult and time-consuming to determine which tear is the most critical single tear in the balloon envelope between tear stoppers. The FAA does not agree. An analysis, or a combination of test and analysis, would be an acceptable means of determining the most critical single tear. It would not be necessary to test each kind of tear. No other unfavorable comments were received on the proposal to add a new § 31.19. Accordingly, § 31.19 is adopted without substantive change.

Proposal 8–85. No unfavorable comments were received on the proposal to amend § 31.27(c) to be consistent with new § 31.19, Performance: Uncontrolled descent. Accordingly, the proposal is adopted without substantive change.

Proposal 8–86. No unfavorable comments were received on the proposal to amend § 31.65 updating the position light standards and expressing them in language consistent with related standards in other airworthiness parts. However, the FAA finds that the use of a cross reference to § 23.1397 as proposed in § 31.65(e) may be inconvenient for those governed by Part 31. Accordingly, § 31.65, as adopted, sets forth the chromaticity coordinates for aviation red and aviation white as currently prescribed in § 23.1397.

Proposal 8–87. No unfavorable comments were received on the proposal to amend § 31.71. However, after further consideration, the FAA concludes that proposed § 31.71(a)(2) is unnecessarily restrictive in that it would, in all cases, require marking the equipment as to its identification, function, and operating limitations. Marking of the equipment as to its identification, function, or operating limitations, or any applicable combination of those factors is sufficient. This is also the language used in corresponding sections of other aircraft airworthiness regulations. Section 31.71, as adopted, is revised accordingly.

Proposal 8–88. No unfavorable comments were received on the proposal to amend § 31.81 to detail operating limitations and information. The FAA notes, however, that proposed § 31.81(b) is not clear as to which "operating limitations and other information necessary for safe operation" must be furnished. The FAA's intent, as stated in the explanation, is to require that the information established under § 31.81(a) be furnished. Section 31.81(b) is revised accordingly. Section 31.81(a) is adopted without substantive change.

Proposal 8–89. A commenter is concerned that proposed § 31.82 might require balloon manufacturers to prepare two overlapping maintenance documents—the maintenance manual currently supplied to operators/owners, and the proposed Instructions for Continued Airworthiness. The FAA notes that under §§ 31.82 and 21.50(b), balloon manufacturers would be required to prepare and furnish only the Instructions for Continued Airworthiness.

The FAA notes further (as discussed under Proposal 8–21) that the Instructions for Continued Airworthiness need not be finalized until delivery of the first balloon, while § 31.82, as proposed, could be interpreted to require that they be finalized before type certification. This point is clarified in § 31.82, as adopted, consistent with the corresponding requirement in Parts 23, 25, 27, and 29.

Proposal 8–90. No unfavorable comments were received on the proposal to amend § 31.85(b)(1). However, a commenter questions whether percentage figures on the required fuel quantity gauge would be acceptable. The FAA has determined that, in the particular case of balloons (for which the fuel

repair of the key elements of a balloon—the balloon envelope and its basket or trapeze. This information is incorporated in paragraph A31.3(i) as revised.

Proposal 8–92. A commenter objects to § 33.4 insofar as it would require completion of the Instructions for Continued Airworthiness before the type certificate is issued, contending that a scant portion of the data and other material called for is typically not compiled until 6 months or longer after type certification. The commenter suggests that manufacturers be allowed to prepare and make available the Instructions for Continued Airworthiness before the first aircraft equipped with the subject engine is put into service, which, it claims, is the earliest such instructions would be needed. Requiring the engine manufacturer to complete the Instructions for Continued Airworthiness before the type certificate is issued would constitute an unnecessary burden. However, the FAA considers that they must be made available, and furnished, upon delivery of the first engine on an aircraft or issuance of a standard certificate of airworthiness for the aircraft, whichever occurs later. This would be consistent with corresponding requirements proposed for other products. See Proposals 8–5 and 8–21. Section 33.4 is revised and adopted accordingly.

Proposal 8–93. A commenter observes that § 33.5 requires that the instruction manual for installing and operating the engine be "approved," whereas proposed § 33.4 requires that the instructions for Continued Airworthiness be "acceptable to the Administrator," and recommends that the latter term be used for consistency. The FAA notes that the term "acceptable to the Administrator" is widely used in Part 43 in connection with maintenance requirements, whereas the term "approved" is more frequently used in FAR Parts containing installation and operating requirements. Considering the FAR as a whole, the FAA does not agree that such consistency is essential. Accordingly, § 33.5 is adopted as proposed.

Proposal 8–94. Several commenters object to proposed §§ 33.6(e) and (f), and to proposed §§ 23.1521(a) and 25.1521(a) (Proposals 8–20 and 8–56, respectively) on the grounds that the use of rated takeoff power or thrust for 10 minutes with one engine inoperative should not be limited to "the extent that the utilization is necessary for the airplane to avoid, without necessitating turning maneuvers, obstacles beneath the flight path intended for the airplane prior to the loss of the engine." In light of these comments and after further review, the FAA concludes that these proposals are premature and they are withdrawn.

In addition, the proposed transfer of the definitions for rated power and thrust from § 1.1 to proposed new § 33.6, Proposal 8–1, is withdrawn since the transfer may cause confusion in the administration of the aircraft certification requirements. Accordingly, Proposals 8–1, 8–20, 8–56, and 8–94 are withdrawn.

Proposal 8–95. For discussion of proposed § 33.19(b) see the discussion under Proposal 8–103. Revised § 33.19 is adopted without substantive change.

Amendment to §§ 33.55(c), 33.57(b), 33.93(b), and 33.99(b). Because of the deletion of §§ 33.5(c), (d), and (e), and the addition of a new § 33.4, the reference to "§ 33.5" in §§ 33.55(c), 33.57(b), 33.93(b), and 33.99(b) is no longer appropriate. For consistency, the reference is "§ 33.4." This change was inadvertently overlooked and was not proposed in Notice 75–31 (40 FR 29410; July 11, 1975). This editorial change corrects that discrepancy. Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 8–97. A commenter recommends that § A33.3(a)(6) of Appendix A to Part 33 be revised by adding the words "requiring periodic attention" so as to make it clear that scheduling information is required solely for parts that require such attention. The language in this section is adequate. For parts not needing periodic attention, the applicant has only to state that parts not scheduled need not be serviced.

A commenter infers incorrectly that proposed §§ 43.16 and 91.163(c) apply only to rotorcraft. These regulations with the revision proposed also affect other classes of aircraft, as well as engines and propellers.

requirements. Considering the FAR as a whole, the FAA does not agree [illegible] in this instance. Accordingly, § 35.3 is adopted as proposed.

Proposal 8–99. In response to the concern of a commenter representing a number of Part 121 operators, the FAA notes that there is no requirement that any operator/owner use the instructions for Continued Airworthiness referred to in proposed § 35.4. The new §§ 43.13(a), 43.16, and 91.163(c) allow the use of other methods. In particular, the use of maintenance manuals and continuous airworthiness maintenance programs developed under Parts 121, 123, 127, and 135, or an inspection program approved under § 91.217(e) would be acceptable alternatives to the Airworthiness Limitations section. This commenter suggests that language be added to proposed § 35.4 to make it clear that such alternatives may be used. The FAA agrees. The language in §§ 43.16 and 91.163(c) is revised accordingly.

Consistent with the discussion on proposed § 33.4 dealing with engines (see Proposal 8–92), the FAA finds that requiring the propeller manufacturer to complete the instructions for Continued Airworthiness before the type certificate is issued would constitute an unnecessary burden. Accordingly, § 35.4 as adopted, requires that those instructions be made available and furnished upon delivery of the first aircraft with the propeller installed, or upon issuance of a standard certificate of airworthiness for an aircraft with the propeller installed, whichever occurs later.

Proposal 8–100. No unfavorable comments were received on the proposal to amend § 35.5 to more clearly indicate the basis for operating limitations and where they are listed. Accordingly, § 35.5 is adopted without substantive change.

Proposal 8–101. No unfavorable comments were received on the proposal to amend § 35.23 to provide an extreme low pitch indication. Accordingly, § 35.23 is adopted without substantive change.

Proposal 8–102. A commenter does not concur with the proposal to revise § 35.37 to require evaluation of metallic hubs and blades, stating that the words "must", "all", and "reasonably foreseeable" in the second sentence imply responsibility beyond current knowledge and the state of the art. The FAA does not agree. These terms are used in the current rule and the current state of the art defines the limits of the provision.

The same commenter recommends that § 35.37 be revised to apply to consideration of "normal and reasonably foreseeable load patterns," to account for the fact that only normal operations will or should be considered. The FAA does not agree. Load patterns which are reasonably foreseeable are critical and should be investigated even if they are not normal.

The same commenter also indicates that the third sentence should be revised to eliminate the term "reduction factors," since reduction factors are identified with only one particular method of presentation. The FAA agrees and the section is revised accordingly. This commenter finally states that the explanation implies that manufacturers have not taken permissible damage and material variation into account. This implication is not intended. It is the FAA's view that the fatigue evaluation should consider the occurrence of typical service damage and variation in material properties and the rule would provide for such an evaluation.

Another commenter suggests that the section be revised by adding certain technical requirements that are related to infinite component life. It is not necessary to specify requirements concerning infinite component life, since they are considered a normal part of propeller fatigue testing.

Section 35.37 is adopted as revised.

Proposal 8–109. A commenter objects to the proposal to add a new § 35.42 to define durability requirements for propeller blade pitch control system components, stating that. the term "bench tests" in §§ 35.42(a) and (b) is too descriptive and restrictive. The FAA agrees that a reference to "bench tests" may be too restrictive. Other test methods may be equally acceptable in providing the necessary data. Accordingly, §§ 35.42(a) and (b) are revised to eliminate the specific reference to "bench."

service experience. The FAA recognizes that service experience can provide a statistical basis for determining component reliability. Its applicability, however, may vary according to such considerations as type of operation, the nature of the article under consideration, the degree of similarity between the reference article and the certification article, and the completeness of service records. Since it is dependent on such a variety of factors, the FAA does not agree that a specific alternative based on service experience should be included.

The proposal to add a new § 35.42, therefore, is adopted with the change discussed below. No adverse comments were received on the related proposed revisions to §§ 23.905, 25.905, and 33.19 to add the reference to new § 35.42, and the revisions are adopted.

Proposal 8–104. For comments related to the proposal to add a new Appendix A to Part 35, see Proposals 25 and 97.

A commenter objects to proposed § A35.1(c) of the appendix because the propeller owner (aircraft operator) would be wastefully provided with instructions and data that the propeller owner has no authority to use. The FAA does not agree. The instructions for Continued Airworthiness must be furnished to the aircraft owner/operator who is the person responsible for maintaining the aircraft (including the propeller). The owner/operator may not be authorized to maintain the propeller, but the owner/operator can place the instructions in the hands of persons who are authorized.

The new Appendix A to Part 95, as adopted, is revised in accordance with comments discussed in Proposal 8–97.

Proposal 8–105. The proposed revision of § 43.9(a)(4) is being deferred for consideration in a forthcoming notice of proposed rule making of the Operations Review Program.

Proposal 8–106. A commenter representing a number of scheduled air carriers is concerned that the use of maintenance manuals and continued airworthiness programs developed under current § 121.133 and Subpart L of Part 121 (generally via Maintenance Review Board procedures), or under similar provisions of Parts 127 and 135, might not be acceptable as "other methods, techniques, and practices" under the terms of proposed § 43.13(a). This commenter suggests that language be added to proposed § 43.13(a) to make this clear. The FAA does not agree. The proposed language states that the use of such manuals and continued airworthiness programs is acceptable.

Proposal 8–107. A commenter representing a number of scheduled air carriers recommends that the Airworthiness Limitations section referred to in proposed § 43.16 include life limitations only and not inspections or other maintenance items. As discussed under Proposal 8–3, the FAA does not agree.

A commenter suggests that the words "or other methods, techniques; and practices acceptable to the Administrator" be added at the end of proposed § 43.16 to make it consistent with proposed § 49.13(a). The Airworthiness Limitations section contains specific mandatory replacement times and inspection intervals (with related procedures) that must be complied with, unless it can be shown by an operator with an approved maintenance program that these times are inappropriate for his operation. The use of alternatives not covered in the Airworthiness Limitations section would be allowed if approved by the Administrator. Section 43.16 is revised to specifically state the alternatives to compliance with the Airworthiness Limitations section.

Proposal 8–108. No unfavorable comments were received on the proposal to amend § 45.11 to qualify, with respect to manned free balloons, the requirements in § 45.11(a) that deal with the location of the identification plate. Accordingly, the proposal is adopted without substantive change.

Proposal 8–109. No unfavorable comments were received on the proposal to amend § 45.13 to correctly reference §§ 45.11(a) and (b) with regard to identification plate requirements. Accordingly, the proposal is adopted without substantive change.

to part and serial numbers, such as symbols enabling the identification of the part as one for which a replacement time, inspection interval, or related procedure is specified in an Airworthiness Limitations section. Identification of such parts is clearly essential for safety. Accordingly, § 45.14 is adopted as revised.

Proposal 8–111. A commenter representing a number of scheduled air carriers recommends that the words "inspection interval, or related procedure" be deleted from proposed § 91.163(c). The supporting rationale is the same as that submitted by this commenter concerning Proposal 8–3 to amend § 21.31(c). As discussed under Proposal 8–3, the FAA disagrees. However, § 91.163(c) is revised to specifically identify the acceptable alternatives to compliance with the "Airworthiness Limitations" section.

The language in proposed § 91.163(c) covers rotorcraft as well as airplanes, balloons, engines, and propellers. To make this clear, the word "Rotorcraft" in § 91.163(c) has been changed to "Manufacturer's", and a statement has been added that operations specifications approved by the Administrator may be used in lieu of the instructions for Continued Airworthiness. Section 91.163(c) is adopted as revised.

Proposal 8–112. No unfavorable comment was received on the proposal to amend § 91.165 to clarify maintenance personnel entries in maintenance records. Accordingly, the proposal is adopted without substantive change.

Proposal 8–119. Several commenters object to §§ 91.173(a)(2) (i) and (iii). A commenter states that adoption of the proposal would result in an inconsistency between § 91.173 and § 121.380, which contains the recordkeeping requirements for aircraft maintained under Part 121. The commenter also states that this inconsistency would cause great difficulty and economic hardship whenever an aircraft is sold by a Part 121 operator to a Part 91 operator and the Part 91 aircraft is maintained by a Part 121 operator under its repair station certificate. According to the commenter, the economic hardship would occur to both the Part 91 operator and the repair station. The same commenter contends that reliability information accumulated in recent years on transport category airplanes shows that there is no need for individualized total time records on equipment and components. Another commenter states that proposed requirements would result in large increases in maintenance costs for Part 91 operators and that only those components that are life-limited should have to carry total times.

The FAA concludes, however, that revision of § 91.173(a)(2)(i) would contribute significantly to safety with little burden on those affected. The currently prescribed record of total time in service for the airframe does not generally apply to the aircraft's engines or propellers, since these components are frequently overhauled (or replaced) at different times. As a practical matter, it is known that operators of such aircraft normally keep records from which the total time in service of engines and propellers can be derived. Therefore, the FAA does not agree that the requirement to keep total times on engines and propellers would be a hardship and burden upon the operators. Accordingly, § 91.173(a)(2)(i) is adopted without change.

In light of the comment on proposed § 91.173(a)(2)(iii), the FAA has given further review of the proposal and has concluded that existing requirements satisfy the objective of the proposal. Accordingly proposed § 91.173(a)(2)(iii) is withdrawn.

The reporting and recordkeeping requirements contained in § 91.173 have been approved by the Office of Management and Budget in accordance with the Federal Reports Act of 1942.

Proposal 8–114. Several commenters agree with the intent of proposed § 91.193(c)(4) but suggest changes. A commenter suggests that the proposed installation instructions for hand fire extinguishers would be more appropriately placed in the type certification rules. The FAA does not agree. New type certification rules do not apply to aircraft already in service.

A commenter suggests that the words "unless obvious" be added to clarify when the hand fire extinguisher stowage provisions must be properly identified. The FAA agrees. Proposed § 91.193(c)(4) is revised and adopted accordingly.

Proposals 8–116, 8–117, 8–118, and 8–119. Final action on Proposals 8–116, 8–117, 8–118, and 8–119 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8–120. In light of the need to conduct further testing of protective breathing equipment, the FAA withdraws its proposal to amend § 121.337, which will be addressed in an upcoming notice of proposed rule making.

Adoption of the Amendment

Accordingly, Parts 11, 21, 23, 25, 27, 29, 31, 33, 35, 43, 45, and 91 of the Federal Aviation Regulations are amended, effective October 14, 1980.
(Sections 313(a), 601, 603, and 604 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424)); and Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)))

The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this document is contained in the docket. A copy of it may be obtained by writing to the individual and address listed in the "For Further Information Contact" paragraph.

Amendment 35–6

Revision of General Operating and Flight Rules

Adopted: August 7, 1989 **Effective: August 18, 1990**

(Published in 54 FR 34284, August 18, 1989)

SUMMARY: This amendment reorganizes and realigns the general operating and flight rules to make them more understandable and easier to use. Also, several changes are made to provide more flexibility for certain operations. These changes result from comments received from the general public and aviation industry in response to a request for specific comments to help identify substantive areas needing review.

EFFECTIVE DATE: This amendment becomes effective on August 18, 1990, except that § 91.203(a)(2) becomes effective September 18, 1989, and remains numbered as § 91.27(a)(2) until August 18, 1990.

FOR FURTHER INFORMATION CONTACT: William T. Cook (202) 267–3840 or Edna French (202) 267–8150, Project Development Branch (AFS–850), General Aviation and Commercial Division, Office of Flight Standards, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591.

SUPPLEMENTARY INFORMATION:

Background

On August 9, 1978, the Aircraft Owners and Pilots Association (AOPA) petitioned the Federal Aviation Administration (FAA) to revise Part 91 of the Federal Aviation Regulations (FAR) to make the regulations simpler and more comprehensible. In response to this petition, on January 11, 1979, the FAA issued an Advance Notice of Proposed Rulemaking (ANPRM) No. 79–2(44 FR 4572; January 22, 1979) consisting of a verbatim publication of AOPA's proposal.

Group concluded that the reorganization and rewriting of the regulation and make it more understandable and easier to use. Consequently, the FAA published NPRM No. 79–2A (46 FR 45256; September 10, 1981), which proposed to reorganize and realign the general operating and flight rules to make them more understandable and easier to use. Other proposals were made to delete redundancies and obsolete compliance dates and to make other minor changes.

Notice No. 79–2A did not contain any substantive changes; however, it did inform the public that the FAA considered that notice to be the first step in a regulatory review of Part 91 consistent with the objective of Executive Order 12291. With this in mind, the FAA invited additional specific comments to help identify substantive areas to be reviewed and possibly included in subsequent proposals concerning Part 91. The notice further stated that the FAA would not take final action concerning the reorganization until substantive changes were proposed and the public had been given an opportunity to comment on those proposals.

The FAA published Notice No. 79–2B (46 FR 60461; December 10, 1981) to extend the comment period for Notice No. 79–2A by 120 days. That notice was issued in response to a petition from the National Business Aircraft Association to allow additional time for commenters to prepare substantive comments.

The FAA received 69 comments in response to Notice No. 79–2A. The majority of these comments favored the proposal and were discussed in Notice No. 79–2C (50 FR 11292; March 20, 1985). Notice 79–2C proposed four substantive changes in addition to the numerous changes made to reorganize and clarify existing rules. Two of these changes were made in response to comments received from the public. These changes are as follows:

(1) Section 91.117—Allows reciprocating-powered aircraft to be operated at 200 knots in an airport traffic area;

(2) Section 91.135—Allows operators desiring authorizations to deviate from positive control area and route segment requirements to utilize a 48-hour oral notification system;

(3) Section 91.409—Allows operators of turbine-powered rotorcraft to use an alternate inspection program, such as an FAA-approved inspection program; and

(4) Sections 91.205,91.509, and 91.511—Defines "shore" as it is used in these sections to exclude tidal flats.

Public Comments

Forty-seven comments were received in response to Notice No. 79–2C. A number of commenters recommended regulations that were not proposed in the notice. Because such comments discuss matters which the public has not had an opportunity to consider, they are beyond the scope of the notice and cannot be considered without further notice and public participation. Some of these comments concern proposals that will be considered by the FAA in future rulemaking and, therefore, could be published in a future notice.

There were two areas in particular where several proposals were received that are not within the scope of the notice. First, 11 comments specifically request that balloons be excepted from certain requirements now pertaining to aircraft in general. These comments seek substantive change to the existing regulations not proposed in the notice.

Second, a number of commenters propose substantive changes to the regulations with regard to rotorcraft. Although these comments are not within the scope of this rulemaking, they were considered in the Rotorcraft Regulatory Review Program, Notice No. 5.

Two commenters are opposed to changing masculine references to "airman" to read "he or she." One commenter states that this would keep the text shorter and speed up the reading of the text.

are statute or nautical miles. The FAA agrees that such references should be clear. Accordingly, references to distance expressed in miles in §§ 91.171(b)(4)(ii) and 91.207(e)(3) are changed by adding the word "nautical" to reflect that the distances are expressed in nautical miles since they reference ground-measured distance. References to visibilities in §§ 91.155(b), 91.167(b)(2)(ii), and 91.303(e) are changed by adding the word "statute" to reflect that visibilities are expressed in statute miles.

Several commenters state that the proposed wording for § 91.1 implies that operations of moored balloons, kites, unmanned rockets, and unmanned free balloons are governed by Part 103. This comment has merit and § 91.1 is revised by adding a specific reference to Part 101 after the phrase "unmanned free balloons" to make clear that moored balloons, kites, unmanned rockets, and unmanned free balloons operate under Part 101.

Another commenter requests clarification of the discussion of § 91.7 in Notice No. 79–2C, where the FAA states that there is no provision for the use of an approved Minimum Equipment List (MEL) in Part 91 operations, whereas § 91.213 permits the use of an approved MEL. The FAA points out that at the time Notice No. 79–2C was published, the effective date of current § 91.30 (proposed § 91.213) was stayed indefinitely (44 FR 62884; November 1, 1979). Amendment No. 91–192 (50 FR 51188; December 13, 1985) which took effect on March 13, 1986, terminated the stay.

Section 91.7(b), which was proposed without substantive change from existing § 91.29, provides that a flight. should be discontinued when unairworthy mechanical or structural conditions occur. One commenter suggests that this be changed by deleting "mechanical or structural" and making it more general so as to provide for a possible unairworthy electrical system. This suggestion raises a valid point; however, the FAA has determined that the rule should be amended to explicitly reference mechanical, electrical, or structural conditions. Therefore, § 91.7(b) is amended accordingly.

As suggested by one commenter, § 91.21(a)(1) is amended by deleting reference to a "commercial operator." This revision conforms § 91.21(a)(1) with SFAR 38–2 and Part 125 which do not provide for a commercial operator's certificate and, instead, provide for the issuance of either an "air carrier operating certificate" or an "operating certificate."

One commenter states that consideration should be given to better defining "appropriately rated pilot" in § 91.109 and provide a definition. The FAA agrees that the phrase "appropriately rated pilot" should be defined better.

The preamble to Amendment No. 91–36(32 FR 260; January 11, 1967) states that an "appropriately rated pilot" in § 91.21(b) requires a private pilot certificate with an airplane category rating, a multiengine class rating for a small multiengine land plane, and a type rating for a large airplane or a turbojet-powered airplane (large or small).

Accordingly § 91.109(b)(1) is amended to require that the safety pilot hold at least a private pilot certificate with category and class ratings appropriate to the aircraft being flown.

One commenter urges the FAA to reinsert the current rule regarding visual descent points (VDPs)(current § 91.116). VDPs are not an integral part of the approach procedure. An aircraft that is not equipped to identify a VDP has the same approach minima as a similar aircraft that is equipped to identify the VDP.

Mandatory use of VDPs is considered inappropriate for a number of reasons:

(1) VDPs that use Distance Measuring Equipment (DME) fixes may, because of displacement factors and/or fix errors, result in descent angles that are either too shallow or too steep for the approach.

(2) A mandatory VDP rule discourages the purchase and use of the very equipment necessary to identify the VDP. This is so because compliance can only be required of those aircraft that are equipped to identify the VDP.

Registration Application as provided in § 47.31(b). The commenters assert that the proposal is a substantive change and not a clarification of the present rule; and that the FAA should consider the economic impact on the industry, the consumers, and the historical precedence of past practices. These commenters suggest that the FAA withdraw the proposal and acknowledge the pink copy of the application as a temporary certificate of registration.

Another commenter is of the opinion that the FAA has not provided discussion, as required by Executive Order 12291, on the economic impacts that would result from the delay between application for an issuance or denial of the registration certificate, under the proposals, in the NPRM. The commenter maintains that future investment purchases and leases would also be adversely affected. Several commenters also question the regulatory consistency that the FAA claims as the basis for the change.

These comments were responded to in full in a Notice of Legal Opinion issued December 1988 (53 FR 50208; December 14, 1988). That Notice of Legal Opinion stated that the limitation of temporary authority to operate an aircraft without registration to domestic operations (as also provided in new 91.203(a)(2)) reflects current U.S. law and practice. Concerning the economic impact of this ruling, the FAA in that Notice of Legal Opinion answered:

> The aviation community has always been able to transfer ownership and register their aircraft with difficulty. In order to mitigate the potential hardship that could result from grounding an aircraft used in international operations, pending receipt of a registration certificate, the Registry will, upon request, telex a copy of the Certificate of Aircraft Registration to the individual whose name appears on the application as the registered owner of the aircraft. The telex copy is issued after confirmation of the information contained on an Aircraft Registration Application and determination of eligibility for registration. The telex, which reflects critical and verified information resulting from the evaluation by the Registry of an application for aircraft registration, may be used as a temporary Certificate of Aircraft Registration until the original certificate is forwarded for carriage in the aircraft.
>
> This telex certificate will assist owners who submit an application for aircraft registration and who wish to operate the aircraft as soon as possible in international operations. Since the telex, by its terms, is a form of registration certificate, the aircraft may be operated in international air navigation consistent with Article 29 of the Convention [Convention on international Civil Aviation (61 Stat. 1180; T.I.A.S. 1591; 15 U.N.T.S. 295)]. The Registry will telex this copy within a matter of days-often within 48 hours-to be kept in the aircraft until the original Certificate of Aircraft Registration (AC Form 8050–3) is forwarded to the registered owner.

Accordingly, the FAA has determined that the rule should be amended as proposed, and consistent with the Chief Counsel's legal opinion, to provide explicitly that operations of aircraft outside the United States for which an application for registration has been submitted but certificate of registration has not been issued are not authorized under the Federal Aviation Regulations.

Several judicial decisions have defined the ''shore'' as including tidal flats. In some parts of the United States, these tidal flats can extend for several miles and, because of the extreme tides prevalent in these areas, the land may be submerged under as much as 25 to 35 feet of water during periods of high tide. The intent of the rule is to require operators carrying passengers for hire over these areas to equip their aircraft with the necessary flotation gear and pyrotechnic devices. Therefore, ''shore,'' when it is used in §§ 91.205,91.509, and 91.511, is defined to exclude land areas, such as tidal flats, which are intermittently under water.

An incorrect reference to ''§ 91.169'' was used in proposed § 91.409(e), which has been corrected to ''§ 91.409'' in the final rule.

It was pointed out by several commenters that the word ''stop'' in § 91.605(c)(2) was inadvertently included in the proposal and should be deleted. The commenters are correct, and the final rule has

word "in-flight" is being added to return the language to its original intent.

Other changes are nonsubstantive in nature. Except for such minor revisions, those parts of the proposal for which there were no comments are adopted as proposed. Finally, all other sections of Part 91 remain unchanged except for renumbering (see the cross-reference lists below).

Several amendments to Part 91 adopted since Notice No. 79–2C were published are reflected in the final rule. Where reference to other sections of this part were set forth in an amendment, the references have been changed to reflect the appropriate sections as used in the final rule. Those required changes published in the Federal Register prior to June 19, 1989, are discussed below.

Amendment No. 91–188, (50 FR 15380; April 17, 1985) amended current § 91.11, which governs the use of alcohol or drugs by any crewmember performing duty during the operation of an aircraft. This amendment took effect on June 17, 1985. Subsequently, Amendment No. 91–194 (51 FR 1229; January 9, 1986) amended § 91.11(c) to impose a requirement for a crewmember to furnish the results of any test that indicates percentage by weight of alcohol in a crewmember's blood. This amendment took effect on April 9, 1986. Proposed § 91.17 has been revised accordingly.

Amendment No. 91–189, (50 FR 31588; August 5, 1985) removed references to expect approach clearance time" in § 91.127. This amendment took effect on September 4, 1985. Section 91.185 reflects this amendment.

Amendment No. 91–190, (50 FR 45602; November 1, 1985) added a new paragraph (c) to current § 91.24. This amendment took effect on December 2, 1985. This new paragraph required all aircraft equipped with an operable radar beacon transponder be turned on while airborne in controlled airspace. Subsequently, § 91.24(c) was amended by Amendment No. 91–203 (53 FR 23374; June 21, 1988). Proposed § 91.215(c) has been redesignated as paragraph (d) and the changes brought about by Amendment Nos. 91–190 and 91–203 have been incorporated into revised § 91.215(c).

Amendment No. 91–191, (50 FR 46877; November 13, 1985) amended current § 91.14 (proposed § 91.107) by revising the title and the section to include reference to shoulder harnesses. This amendment took effect on December 12, 1985. Section 91.107 has been revised accordingly. Amendment No. 91–191 also added a new paragraph to current § 91.33 which requires a shoulder harness for specified seats in normal, utility, and acrobatic category airplanes with a seating configuration, excluding pilot seats, of nine or less, manufactured after December 12, 1986. This paragraph appears as § 91.205(b)(15).

Amendment No. 91–192, (50 FR 51189; December 13, 1985) terminated the suspension of Amendment No. 91–157 (44 FR 43714; July 26, 1979) staying the effective date of current § 91.30. This amendment took effect on March 31, 1986. Subsequently, Amendment No. 206 (53 FR 50195; December 13, 1988) amended § 91.30. Section 91.213 reflects these amendments.

Amendment No. 91–193, (50 FR 51193; December 13, 1985) changed the FAA's description of North Atlantic (NAT) Minimum Navigation Performance Specifications (MNPS) airspace to coincide with the international Civil Aviation Organition's (ICAO's) description of the NAT MNPS airspace. This has been reflected accordingly in Section 1 of Appendix C of this final rule.

Amendment No. 91–195, (51 FR 31098; September 2, 1986) corrects the reference to the Department of Defense office in current § 91.102 restricting the flight of aircraft near space flight operations. This amendment took effect on September 15, 1986. Section 91.143 reflects this amendment.

Amendment No. 91–196, (51 FR 40692; November 7, 1986) upgraded rotorcraft certification and operational requirements, thus effecting amendments to several FARs. This amendment took effect on January 6, 1987. Current § 91.2 was amended to afford small helicopter operators the opportunity to apply for Category il instrument approach authorization. Proposed § 91.193 has been revised accordingly. Current § 91.23 was amended to reduce the IFR reserve fuel requirement for helicopters from 45 to 30 minutes. Proposed § 91.167 has been amended to reflect this change. Current § 91.116 (proposed § 91.175) was amended to establish a separate takeoff minimum for helicopters under IFR, of one-half mile visibility.

amendment took effect on February 17, 1987. This rule now appears as § 91.551(a)(3).

Amendment No. 91–198, (52 FR 3391; February 3, 1987) amended current § 91.24(a) and (b) on ATC transponder and altitude reporting equipment and use. This amendment took effect on April 6, 1987. Subsequently, Amendment No. 91–203 (53 FR 23374; June 21, 1988) amended § 91.24(b) and (c) and Amendment No. 91–210 (54 FR 25682; June 16, 1989) revised § 91.24(a).

Proposed § 91.215 has been revised accordingly. Amendment No. 91–198 also revised paragraph (b)(2)(iii) of current § 91.90 to allow operations conducted prior to December 1, 1987, in Group II TCAs, to be exempt from the new equipment requirements of current § 91.24. Amendment No. 91–203 (53 FR 23374; June 21, 1988) subsequently revised § 91.90, effective July 21, 1988. Amendment No. 91–205 (53 FR 40323; October 14, 1988) further revised § 91.90 in its entirety effective January 12, 1989. Amendment No. 90–209 (54 FR 24883; June 9, 1989) amended § 91.90 by delaying the effective date of the section for helicopter operations. The rule, covering all amendments to date, appears in this revision as § 91.131.

Amendment No. 91–199, (52 FR 9636; March 25, 1987) amended current § 91.35 by renumbering the paragraphs and adding a new paragraph that requires any operator who has installed approved flight recorders and approved cockpit voice recorders to keep the recorded information for at least 60 days, or longer, if requested by the Administrator or the National Transportation Safety Board. This amendment took effect on May 26, 1987. The amended rule now appears as § 91.609.

Amendment No. 91–200, (52 FR 17277; May 6, 1987) amended current § 91.173 by requiring each registered aircraft owner or operator to keep "preventive maintenance" records as well as maintenance, alteration, and records of the 100-hour annual, progressive, and other required or approved inspections, as appropriate, for each engine, propeller, rotor, and appliance of an aircraft. This amendment took effect on June 5, 1987. This amended rule now appears as § 91.417(a)(1).

Amendment No. 91–201, (52 FR 20028; May 26, 1987) adds the reference to Part 129 to the exception in current § 91.161(b) from the requirements of §§ 91.165, 91.169, 91.171, 91.173, and 91.174 for aircraft maintained in accordance with a continuous maintenance program as provided for in Part 129. The amendment took effect on August 25, 1987. This amended rule now appears as § 91.401(b).

Amendment No. 91–202, (52 FR 34102; September 9, 1987 and 52 FR 35234; September 18, 1987) amended current § 91.27 on civil aircraft certification requirements by adding a new paragraph (c) to require that a copy of the form which authorized the alteration of an aircraft with fuel tanks within the passenger or a baggage compartment be kept on board the modified aircraft. This new rule now appears as § 91.203(c). Current § 91.173 on maintenance records was revised by requiring that such records be made available to the Administrator or an authorized representative of the National Transportation Safety Board and when such a fuel tank is installed as set forth in § 91.35 as amended pursuant to Part 43, a copy of the FAA Form 337 be kept on board the modified aircraft. This new rule appears as § 91.417(b) and (c). This amendment took effect on December 8, 1987.

Amendment No. 91–203, (53 FR 23374; June 21, 1988, 53 FR 25050; July 1, 1988, and 53 FR 26592; July 14, 1988) amended or revised § 91.24 (ATC transponder and altitude reporting equipment and use), 91.88 (Airport radar service areas), and 91.90 (Terminal control areas), and by adding a new Appendix D entitled "Airports/Locations Where the Transponder Requirements of § 91.24(b)(5)(ii) Apply," regarding use of transponders with automatic altitude reporting. This amendment took effect on July 21, 1988. Amendment No. 91–205 (53 FR 40323; October 14, 1988) revised § 91.90 in its entirety effective January 12, 1989. Amendment No. 91–209 (54 FR 24883; June 9, 1989) amended § 91.90 by delaying the effective date of the section for helicopter operations. These rules now appear in this revision as §§ 91.215, 91.130, 91.131, and new Appendix D to Part 91, respectively.

Amendment No. 91–204, (53 FR 26145; July 11, 1988) amended current § 91.35 on flight recorders and cockpit voice recorders to require digital flight recorders and voice recorders to be installed on selected aircraft operated in general aviation. The specifications for such recorders are set forth in a

by delaying the application of the section for helicopter operations for one year. Revised § 91.131 covers these amendments.

Amendment No. 91–206 (53 FR 50195; December 13, 1988) amended § 91.30 to permit rotorcraft, nonturbine-powered airplanes, gliders, and lighter-than-air aircraft, for which an approved Master Minimum Equipment List has not been developed, to be operated with inoperative instruments and equipment not essential for the safe operation of the aircraft. The amendment also permits general aviation operators of small rotorcraft, nonturbine-powered small airplanes, gliders, and lighter-than-air aircraft for which a Master Minimum Equipment List has been developed, the option of operating under the minimum equipment list concept, or under other conditions as set forth in the amendment. Amendment No. 91–206 also amended § 91.165 to require that any inoperative instrument or item of equipment permitted to be inoperative under the new amended § 91.30 to be repaired, replaced, removed, or inspected at the next required inspection for the aircraft. These amendments became effective on December 13, 1988, and appear as §§ 91.213 and 91.405 of this revision to Part 91.

Amendment No. 91–207 (54 FR 265; January 4, 1989) amended §§ 91.1 and 91.61 to extend the controlled airspace and the applicability of certain air traffic rules to coincide with presidential action to extend the territorial sea of the United States for international purposes, from 3 to 12 nautical miles from the U.S. coast. This amendment became effective on December 27, 1988. These amended rules now appear as §§ 91.1 and 91.101.

Amendment No. 91–208 (54 FR 950; January 10, 1989) added a new § 91.26 to require that any traffic alert and collision avoidance system installed in a U.S. registered civil aircraft must be approved by the Administrator, and if installed, must be on and operating during the aircraft's operation. The amendment became effective on February 9, 1989. The amendment appears herein as § 91.221.

Amendment No. 91–209 (54 FR 24883; June 9, 1989) delays the effective date of certain navigational equipment requirements of helicopter operations in a Terminal Control Area (TCA) by the amendment of § 91.90(c)(1). The amendment became effective on June 6, 1989. Section 91.131 covers this amendment.

Amendment No. 91–210 (54 FR 25682; June 16, 1989), effective June 16, 1989, amended § 91.24(a) to allow certain aircraft operators to install non-Mode S transponders in aircraft until July 1, 1992, instead of until January 1, 1992, provided that such transponders are manufactured prior to January 1, 1991, instead of prior to January 1, 1990. This amendment appears as § 91.215(a).

References to Part 91 found in other sections of the Federal Aviation Regulations have also been amended to incorporate the revised numbering of Part 91. These miscellaneous amendments are found at the end of the amendments to Part 91.

Furthermore, §§ 91.615 through 91.645 as identified in Notice No. 79–2C (50 FR 11292; March 20, 1985) now appear in this final rule as §§ 91.503 through 91.533.

Regulatory Evaluation

FAA analysis indicates that these amendments will not have a significant impact on the public or any level of government on an annual basis. The final rule includes changes to clarify the existing rules by simplifying the language, deleting obsolete requirements, consolidating similar regulations, updating equipment requirements to reflect the state-of-the-art, and relaxing certain operating and flight rule requirements.

Benefits

Section 91.117 allows reciprocating-powered aircraft to be operated in an airport traffic area at indicated airspeeds not greater than 200 knots. The FAA is unable to determine operator time and fuel cost savings because they will largely depend on the type of aircraft involved, desired speed, and weather and traffic conditions. The aggregate annual cost savings to these operators will not be significant because: (1) the normal cruise speed for most single engine reciprocating-powered aircraft does not exceed 156

to the water which is above the high water mark, thereby excluding tidal flats. From a safety standpoint, a tidal area covered with water is not as safe an emergency landing place as a dry shoreline. The main benefit is improved survivability from accidents in areas where for-hire operators may not be in compliance with the intent of the present rule. There is insufficient information in accident records to be able to estimate how many deaths could have been avoided through the use of life jackets and pyrotechnic signaling devices in these instances.

Cost

Any cost associated with defining "shore" in § 91.205 as the high water line is expected to be negligible. The only parties potentially affected are small for-hire operators who do not comply with the obvious intention of the rule as presentiy worded. The FAA believes these operators are very few (probably less than 20 operators) in number. Such operators are likely to be traversing tidal flats in areas like Alaska. If such operators do not comply with the rule as written now, then the cost of compliance would be a maximum of about $105 per year per aircraft. This assumes a $50 cost for an approved flotation device per seat and a flotation device useful life of 5 years ($10 per passenger seat per year), 10 seats per aircraft for these specific operators, plus $5 per year per aircraft for a pyrotechnic signaling device.

Section 91.409 allows operators of turbine-powered rotorcraft to use alternate inspection programs such as inspections under an FAA-approved continuous airworthiness maintenance program. The operators may now schedule inspections in a manner that allows the highest level of utilization of their rotorcraft.

The FAA estimates that in 1984 there were approximately 3,000 active turbine-powered rotorcraft in non-air taxi use. The FAA assumes that about one-half of the operators of these aircraft would use the new inspection options.

The value of using these options is difficult to estimate. At a minimum, the major effect of this proposed rule would be one additional day per year of rotorcraft utility. The usefulness of this can be set at least at the cost of capital for 1 day. Using an average aircraft value of $300,000 and a use of 250 days per year, the cost of capital can be estimated at $180 per day ($300,000 at 15 percent interest divided by 250 days). Thus, the minimum benefit is approximately $0.27 million per year (half the fleet, 1500 turbine-powered rotorcraft times $180). As the fleet grows, the value of this benefit also increases.

Because of the reorganization and resulting renumbering of provisions, persons who regularly refer to existing Part 91 must familarize themselves with the new structure. It is also recognized that many non-regulatory materials containing references to present Part 91 sections may have to be modified. To assist in reference to the new provisions, a redesignation table, similar to the cross-reference table published herein, will be included in subsequent editions of the Code of Federal Regulations. The FAA believes that any short-term costs associated with transition to the reorganized Part 91 will be outweighed by the benefits inherent in a more logically organized set of regulations.

Trade Impact

The FAA has determined that this regulation will have no impact on international trade.

Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980 was enacted by Congress in order to insure, among other things, that small entities are not disproportionately affected by Government regulations. The RFA requires agencies to review rules which may have a "significant economic impact on a substantial number of small entities." As discussed above, the regulatory evaluation for Part 91 indicates that there are no negative or significant economic impacts associated with the proposed rule.

All but four of the changes to Part 91 are editorial or clarifying changes. Three of the four changes result only in minimal benefits being applied. The other is a change to § 91.205 which, while it is

February 26, 1979). It causes only four minor changes, three of which will provide benefits with no additional costs to the aviation public. The fourth will impose negligible costs which are substantially outweighed by the benefits provided. Other amendments provide general benefits by deleting obsolete requirements, relaxing certain operating and flight rule requirements, and updating and clarifying the text. Under the provisions of Executive Order 12291, the amendments in this final rule will not have a major economic effect on consumers; industries; Federal, State, or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovations, or the ability of U.S.-based enterprises to compete with foreign-based enterprises in domestic or import markets. It is certified that under the criteria of the Regulatory Flexibility Act this final rule will not have a significant economic impact on a substantial number of small entities. A copy of the full economic evaluation is filed in the public docket and may be obtained by contacting the person listed in the "FOR FURTHER INFORMATION CONTACT" paragraph of this document.

Cross Reference

To identify where present regulations are relocated in the new rule, the following cross-reference lists are provided:

Cross Reference Table

91.1	91.1 and 91.703
91.2	91.193
91.3	91.3
91.4	91.5
91.5	91.103
91.6	91.189
91.7	91.105
91.8	91.11
91.9	91.13
91.10	91.13
91.11	91.17
91.12	91.19
91.13	91.15
91.14	91.107
91.15	91.307
91.17	91.309
91.18	91.311
91.19	91.21
91.20	91.705
91.21	91.109
91.22	91.151
91.23	91.167
91.24	91.215
91.25	91.171
91.26	91.221
91.27	91.203
91.28	91.715
91.29	91.7
91.30	91.213
91.31	91.9
91.32	91.211
91.33	91.205
91.34	91.191
91.35	91.609
91.36	91.217
91.37	91.605

91.49	91.603
91.50	Deleted
91.51	91.219
91.52	91.207
91.53	Deleted
91.54	91.23
91.55	91.817
91.56	91.815
91.57	91.25
91.58	91.613
91.59	91.321
91.61	91.101
91.63	91.903
91.65	91.111 and 91.123
91.67	91.113
91.69	91.115
91.70	91.117
91.71	91.303
91.73	91.209
91.75	91.123
91.77	91.125
91.79	91.119
91.81	91.121
91.83	91.153 and 91.169
91.84	91.707
91.85	91.127
91.87	91.129
91.88	91.130
91.89	91.127
91.90	91.131
91.91	91.137
91.93	91.305
91.95	91.133
91.97	91.135
91.100	91.139
91.101	91.709
91.102	91.143
91.103	91.713
91.104	91.141
91.105	91.155
91.107	91.157
91.109	91.159
91.115	91.173
91.116	91.175
91.117	Deleted
91.119	91.177
91.121	91.179
91.123	91.181
91.125	91.183
91.127	91.185
91.129	91.187
91.161	91.401
91.163	91.403
91.165	91.405
91.167	91.407
91.169	91.409
91.170	91.415
91.171	91.411
91.172	91.413

91.191	91.511
91.193	91.513
91.195	91.515
91.197	91.517
91.199	91.519
91.200	91.521
91.201	91.523
91.203	91.525
91.205	Deleted
91.207	Deleted
91.209	91.527
91.211	91.529
91.213	91.531
91.215	91.533
91.301	91.801
91.302	91.803
91.303	91.805
91.305	91.807
91.306	91.809
91.307	91.811
91.308	91.813
91.309	91.819
91.311	91.821
Appendix A	Appendix A
Appendix B	Appendix B
Appendix C	Appendix C
Appendix D	Appendix D
Appendix E	Appendix E
Appendix F	Appendix F

Cross Reference Table

91.1	91.1
91.3	91.3
91.5	91.4
91.7	91.29
91.9	91.31
91.11	91.8
91.13	91.9 and 91.10
91.15	91.13
91.17	91.11
91.19	91.12
91.21	91.19
91.23	91.54
91.25	91.57
91.101	91.61
91.103	91.5
91.105	91.7
91.107	91.14
91.109	91.21
91.111	91.65
91.113	91.67
91.115	91.69
91.117	91.70
91.119	91.79
91.121	91.81
91.123	91.75 and 91.65
91.125	91.77

91.141	91.104
91.143	91.102
91.151	91.22
91.153	91.83
91.155	91.105
91.157	91.107
91.159	91.109
91.167	91.23
91.169	91.83
91.171	91.25
91.173	91.115
91.175	91.116
91.177	91.119
91.179	91.121
91.181	91.123
91.183	91.125
91.185	91.127
91.187	91.129
91.189	91.6
91.191	91.34
91.193	91.2
91.201	New
91.203	91.27
91.205	91.33
91.207	91.52
91.209	91.73
91.211	91.32
91.213	91.30
91.215	91.24
91.217	91.36
91.219	91.51
91.221	91.26
91.301	New
91.303	91.71
91.305	91.93
91.307	91.15,
91.309	91.17
91.311	91.18
91.313	91.39
91.315	91.40
91.317	91.41
91.319	91.42
91.321	91.59
91.323	91.38
91.401	91.161
91.403	91.163
91.405	91.165
91.407	91.167
91.409	91.169
91.411	91.171
91.413	91.172
91.415	91.170
91.417	91.173
91.419	91.174
91.421	91.175
91.501	91.181
91.503	91.183
91.505	91.185
91.507	91.187

91.523	91.205
91.527	91.209
91.529	91.211
91.531	91.213
91.533	91.215
91.601	New
91.603	91.49
91.605	91.37
91.607	91.47
91.609	91.35
91.611	91.45
91.613	91.58
91.701	New
91.703	91.1
91.705	91.20
91.707	91.84
91.709	91.101
91.711	91.43
91.713	91.103
91.715	91.28
91.801	91.301
91.803	91.302
91.805	91.303
91.807	91.305
91.809	91.306
91.811	91.307
91.813	91.308
91.815	91.56
91.817	91.55
91.819	91.309
91.821	91.311
91.901	New
91.903	91.63
91.905	New
Appendix A	Appendix A
Appendix B	Appendix B
Appendix C	Appendix C
Appendix D	Appendix D
Appendix E	Appendix E
Appendix F	Appendix F

Newly Established Rules

91.201	91.701
91.301	91.901
91.601	91.905

The Rule

For the reasons set forth above, Part 91 of the Federal Aviation Regulations (14 CFR Part 91) is revised and Parts 1, 21, 23, 25, 27, 31, 33, 35, 36, 43, 45, 47, 61, 63, 65, 71, 93, 99, 103, 121, 125, 127, 133, 135, 137, and 141 of the Federal Aviation Regulations (14 CFR Parts 1, 21, 23, 25, 27, 31, 33, 35, 36, 43, 45, 47, 61, 63, 65, 71, 93, 99, 103, 121, 125, 127, 133, 135, 137, and 141) are amended effective August 18, 1990.

The authority citation for Part 35 continues to read as follows:

Authority: 49 U.S.C. 1344, 1354(a), 1355, 1421, 1423, 1424, 1425; 49 U.S.C. 106(g) (Revised Pub. L. 97–449, January 12, 1983).

for the issue of type certificates and changes to those certificates, for propellers.

(b) Each person who applies under Part 21 for such a certificate or change must show compliance with the applicable requirements of this part.

(Amdt. 35–3, Eff. 2/1/77)

§ 35.3 Instruction manual for installing and operating the propeller.

Each applicant must prepare and make available an approved manual or manuals containing instructions for installing and operating the propeller.

(Amdt. 35–5, Eff. 10/14/80)

§ 35.4 Instructions for continued airworthiness.

The applicant must prepare Instructions for Continued Airworthiness in accordance with Appen-

with the propeller installed, whichever occurs later.

(Amdt. 35–5, Eff. 10/14/80)

§ 35.5 Propeller operating limitations.

Propeller operating limitations are established by the Administrator, are included in the propeller type certificate data sheet specified in § 21.41 of this chapter, and include limitations based on the operating conditions demonstrated during the tests required by this part and any other information found necessary for the safe operation of the propeller.

(Amdt. 35–5, Eff. 10/14/80)

§ 35.15 Design features.

The propeller may not have design features that experience has shown to be hazardous or unreliable. The suitability of each questionable design detail or part must be established by tests.

§ 35.17 Materials.

The suitability and durability of materials used in the propeller must—

(a) Be established on the basis of experience or tests; and

(b) Conform to approved specifications (such as industry or military specifications, or Technical Standard Orders) that ensure their having the strength and other properties assumed in the design data.

§ 35.19 Durability.

Each part of the propeller must be designed and constructed to minimize the development of any unsafe condition of the propeller between overhaul periods.

§ 35.21 Reversible propellers.

A reversible propeller must be adaptable for use with a reversing system in an airplane so that no part of the complete reversing system that is in the propeller itself and those other parts that are supplied by the applicant for installation in the aircraft.

§ 35.23 Pitch control and indication.

(a) No loss of normal propeller pitch control may cause hazardous overspeeding of the propeller under intended operating conditions.

(b) Each pitch control system that is within the propeller, or supplied with the propeller, and that uses engine oil for feathering, must incorporate means to override or bypass the normally operative hydraulic system components so as to allow feathering if those components fail or malfunction.

(c) Each propeller approved for installation on a turbopropeller engine must incorporate a provision for an indicator to indicate when the propeller blade angle is below the flight low pitch position. The provision must directly sense the blade position and be arranged to cause an indicator to indicate that the blade angle is below the flight low pitch position before the blade moves more than 8°K βελος τηε φλιγητ λος πιτψη στοπ.

(Amdt. 35–2, Eff. 4/3/67); (Amdt. 35–5, Eff 10/14/80)

(b) Each applicant must furnish testing facilities, including equipment, and competent personnel, to conduct the required tests.

§ 35.35 Blade retention test.

The hub and blade retention arrangement of propellers with detachable blades must be subjected to a centrifugal load of twice the maximum centrifugal force to which the propeller would be subjected during operations within the limitations established for the propeller. This may be done by either a whirl test or a static pull test.

(Amdt. 35–2, Eff. 4/3/67); (Amdt. 35–4, Eff. 5/2/77)

§ 35.37 Fatigue limit tests.

A fatigue evalution must be made and the fatigue limits determined for each metallic hub and blade, and each primary load carrying metal component of nonmetallic blades. The fatigue evaluation must include consideration of all reasonably foreseeable vibration load patterns. The fatigue limits must account for the permissible service deteriortion (such as nicks, grooves, galling, bearing wear, and variations in material properties).

(Amdt. 35–2, Eff. 4/3/67); (Amdt. 35–5, Eff. 10/14/80)

§ 35.39 Endurance test.

(a) *Fixed-pitch wood propellers.* Fixed-pitch wood propellers must be subjected to one of the following tests:

(1) A 10-hour endurance block test on an engine with a propeller of the greatest pitch and the greatest diameter for which certification is requested.

(3) A 50-hour endurance block test on an engine at the power and propeller rotational speed for which certification is sought. This test must be conducted on a propeller of the greatest diameter for which certification is requested.

(b) *Fixed-pitch metal propellers and ground adjustable-pitch propellers.* Each fixed-pitch metal propeller or ground adjustable-pitch propeller must be subjected to the test prescribed in either paragraph (a)(2) or (a)(3) of this section.

(c) *Variable-pitch propellers.* Compliance with this paragraph must be shown for a propeller of the greatest diameter for which certification is requested. Each variable-pitch propeller (a propeller the pitch setting of which can be changed by the flight crew or by automatic means while the propeller is rotating) must be subjected to one of the following tests:

(1) A 100-hour test on a representative engine with the same or higher power and rotational speed and the same or more severe vibration characteristics as the engine with which the propeller is to be used. Each test must be made at the maximum continuous rotational speed and power rating of the propeller. If a takeoff rating greater than the maximum continuous rating is to be established, and additional 10-hour block test must be made at the maximum power and rotational speed for the takeoff rating.

(2) Operation of the propeller throughout the engine endurance tests prescribed in Part 33 of this subchapter.

(Amdt. 35–2, Eff. 4/3/67); (Amdt. 35–3, Eff. 2/1/77)

the pitch and rotational speed ranges.

(c) *Automatically controllable propellers.* 1,500 complete cycles of control must be made throughout the pitch and rotational speed ranges.

(d) *Feathering propellers.* 50 cycles of feathering operation must be made.

(e) *Reversible-pitch propellers.* Two hundred complete cycles of control must be made from lowest normal pitch to maximum reverse pitch, and, while in maximum reverse pitch, during each cycle, the propeller must be run for 30 seconds at the maximum power and rotational speed selected by the applicant for maximum reverse pitch.

(Amdt. 35–3, Eff. 2/1/77)

§ 35.42 Blade pitch control system component test.

The following durability requirements apply to propeller blade pitch control system components:

(a) Except as provided in paragraph (b) of this section, each propeller blade pitch control system component, including governors, pitch change assemblies, pitch locks, mechanical stops, and feathering system components, must be subjected in tests to cyclic loadings that simulate the frequency and amplitude those to which the compo-

The Administrator may require any additional tests he finds necessary to substantiate the use of any unconventional features of design, material, or construction.

§ 35.45 Teardown inspection.

(a) After completion of the tests prescribed in this subpart, the propeller must be completely disassembled and a detailed inspection must be made of the propeller parts for cracks, wear, distortion, and any other unusual conditions.

(b) After the inspection the applicant must make any changes to the design or any additional tests that the Administrator finds necessary to establish the airworthiness of the propeller.

(Amdt. 35–3, Eff. 2/1/77)

§ 35.47 Propeller adjustments and parts replacements.

The applicant may service and make minor repairs to the propeller during the tests. If major repairs or replacement of parts are found necessary during the tests or in the teardown inspection, the parts in question must be subjected to any additional tests the Administrator finds necessary.

propeller part, the Instructions for Continued Airworthiness for the propeller must include the information essential to the continued airworthiness of the propeller.

(c) The applicant must submit to the FAA a program to show how changes to the Instructions for Continued Airworthiness made by the applicant or by the manufacturers of propeller parts will be distributed.

(Amdt. 35–6, Eff. 8/18/90, Amdt. 35–5, Eff. 10/14/80)

A35.2 Format

(a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.

(b) The format of the manual or manuals must provide for a practical arrangement.

(Amdt. 35–6, Eff. 8/18/90, Amdt. 35–5, Eff. 10/14/80)

A35.3 Content

The contents of the manual must be prepared in the English language. The Instructions for Continued Airworthiness must contain the following sections and information:

(a) *Propeller Maintenance Section.* (1) Introduction information that includes an explanation of the propeller's features and data to the extent necessary for maintenance or preventive maintenance.

(2) A detailed description of the propeller and its systems and installations.

(3) Basic control and operation information describing how the propeller components and sys-

work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if it shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the propeller.

(7) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.

(8) Information describing the order and method of removing and replacing propeller parts with any necessary precautions to be taken.

(9) A list of the special tools needed for maintenance other than for overhauls.

(b) *Propeller Overhaul Section.* (1) Disassembly information including the order and method of disassembly for overhaul.

(2) Cleaning and inspection instructions that cover the materials and apparatus to be used and methods and precautions to be taken during overhaul. Methods of overhaul inspection must also be included.

(3) Details of all fits and clearances relevant to overhaul.

(4) Details of repair methods for worn or otherwise substandard parts and components along with information necessary to determine when replacement is necessary.

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must

(Amdt. 35–5, Eff. 10/14/80); (Amdt. 35–6, Eff. 8/18/90)

☆ U.S. GOVERNMENT PRINTING OFFICE: 1993 — 3 0 1 - 7 0 7 / 8 0 0 2 1